



# **XPress-Pro SW 94000**

## **User Guide**

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# 1: Preface

This manual describes how to install and use the Xpress-Pro SW 94000 switch. The switch integrates full wire speed switching technology with SNMP/RMON web-based management functions. Xpress-Pro SW 94000 switch brings the answer to complicated hardened networking environments.

To get the most out of this manual, you should have an understanding of Ethernet networking concepts.

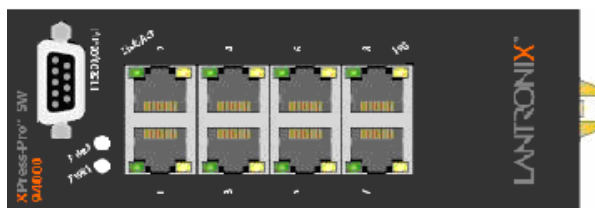
In this manual, you will find:

- ◆ Features on the switch
- ◆ Illustrative LED functions
- ◆ Installation instructions
- ◆ Management Configuration
- ◆ SNMP...
- ◆ Specifications

## 2: Product Overview

### Xpress-Pro SW94000 Switch

Front View



### Package Contents

When you unpack the product package, you shall find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to your authorized reseller.

- ◆ This Management Switch
- ◆ User's Manual
- ◆ External power adapter

### Product Highlights

#### Basic Features

- ◆ Provide:
  - Eight 10/100BaseTX ports
  - Eight 10/100BaseTX ports + one 100BaseFX port
  - Six 10/100BaseTX ports + two 100BaseFX ports
  - Four 10/100BaseTX ports + four 100BaseFX ports
  - Eight 10/100BaseTX ports + one 10/100/1000BaseTX port
  - Eight 10/100BaseTX ports + one 1000BaseSX/LX port
- ◆ 100BaseFX Multi-mode fiber using SC or ST connector up to 2km; single-mode fiber using SC or ST connector up to 75km; WDM single-mode fiber using SC connector up to 40km
- ◆ 1000BaseSX Multi-mode fiber using SC connector up to 550m; 1000BaseLX single-mode fiber using SC connector up to 60km

- ◆ Auto-negotiation for speed and duplexity on all RJ-45 ports
- ◆ Auto MDI/MDIX on all RJ-45 ports
- ◆ Full wire-speed forwarding rate
- ◆ Store-and-forward mechanism
- ◆ Back-pressure and IEEE 802.3x compliant flow control
- ◆ Support 4K MAC addresses
- ◆ Provide 256K bytes memory buffer
- ◆ Meet NEMA TS1/2 environmental requirements for traffic control equipment
- ◆ Meet IEC61000-6-2 EMC Generic Standard Immunity for industrial environment
- ◆ Alarms of power failure by relay output
- ◆ Operating voltage and Max. current consumption: 24VDC @ 0.77A
- ◆ Power consumption: 18.48W Max
- ◆ Power Supply: Redundant DC Terminal Block power inputs
- ◆ Support DIN-Rail installation
- ◆ Front panel port status LEDs

## Management Support

### VLAN

- ◆ Port-based VLAN
- ◆ 802.1Q tagged VLAN

### Trunking

- ◆ Port-based Trunking

### Port Security

- ◆ Limit number of MAC addresses learned per port Load
- ◆ Static MAC addresses stay in the filtering table

### Port-Mirroring

- ◆ Port-mirroring provided through dedicated port, Port 1

### QOS (Quality of Service)

- ◆ Support IEEE802.1p Quality of Service

### CoS (IEEE802.1p Classification of Service)

- ◆ Packet transmission scheduled using Weighted Round Robin (WRR)
- ◆ Classification of packet priority can be based on either a VLAN tag on packet or a user-definable port priority



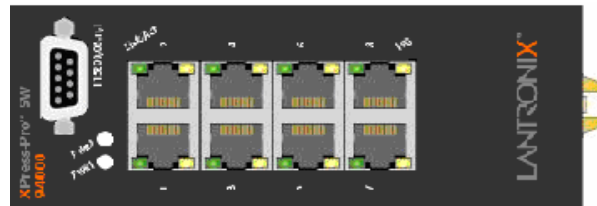
### Internetworking Protocols

- ◆ Bridging: 802.1w Rapid Spanning Tree  
802.1p/Q – GARP/GVRP
- ◆ IP Multicast:IGMP Snooping  
VLANs & IP Multicast sessions
- ◆ Bandwidth Control
- ◆ Rate Control

### Network Management Methods

- ◆ Console port access via RS-232 cable
- ◆ Telnet remote access
- ◆ SNMP agent:
  - MIB-2 (RFC1213)
  - Bridge MIB (RFC1493)
  - RMON MIB (RFC1757) – statistics, history, alarm and events
  - VLAN MIB (802.1Q/RFC2674)
  - Private MIB
- ◆ Java applet-based MIB browser
- ◆ Web browser support based on HTTP server and CGI parser
- ◆ TFTP software-upgrade capability

## Front Panel Display



#### ① Power Status (PWR1, PWR2)

These LEDs come on when the switch is properly connected to power and turned on.

#### ② Port Status LEDs

The LEDs display status for each respective port.

| LED                              | State    | Indication  |
|----------------------------------|----------|---|
| <b>10/100TX or 100FX</b>         |          |   |
| <b>LNK/ACT</b><br>(Green)        | Steady   | A valid network connection established.<br>LNK stands for LINK. |
|                                  | Flashing | Transmitting or receiving data.<br>ACT stands for ACTIVITY.     |
| <b>100</b><br>(Yellow)           | Steady   | Light solid green for a port transferring at 100Mbps.           |
|                                  | Off      | The port is transferring at 10Mbps If this LED is dark.         |
| <b>10/100/100TX or 1000SX/LX</b> |          |   |
| <b>1000</b><br>(Green)           | Steady   | Light solid green for a port transferring at 1000Mbps.          |
|                                  | Off      | The port is not transferring at 1000Mbps If this LED is dark.   |
| <b>ACT</b><br>(Yellow)           | Flashing | Transmitting or receiving data.<br>ACT stands for ACTIVITY.     |
|                                  | Off      | Neither transmitting nor receiving data.                        |

## Physical Ports

The Xpress-Pro SW 94000 switch provides:

- ◆ Eight 10/100BaseTX ports
- ◆ Eight 10/100BaseTX ports + one 100BaseFX port
- ◆ Six 10/100BaseTX ports + two 100BaseFX ports
- ◆ Four 10/100BaseTX ports + four 100BaseFX ports
- ◆ Eight 10/100BaseTX ports + one 10/100/1000BaseTX port
- ◆ Eight 10/100BaseTX ports + one 1000BaseSX/LX port

### Connectivity

- ◆ RJ-45 connectors
- ◆ ST or SC connector on 100BaseFX fiber port.
- ◆ SC connector on 1000BaseSX/LX fiber port.

### Mode Selection

- ◆ 10BaseT full-duplex mode
- ◆ 10BaseT half-duplex mode
- ◆ 100BaseTX full-duplex mode
- ◆ 100BaseTX half-duplex mode
- ◆ 100BaseFX full-duplex mode
- ◆ 1000BaseT/SX/LX full-duplex mode
- ◆ Auto-sensing mode

**Notes:**

- ◆ *Half-duplex mode uses back pressure flow control to prevent the receiving buffer from being overrun by data from a source node.*
- ◆ *Full-duplex mode uses 802.3x flow control standard to prevent fast data traffic from overrunning slow data traffic.*
- ◆ *Auto-sensing mode is in use after auto-negotiating with the other end of the link.*

In general, the Xpress-Pro SW 94000 switch is responsible for switching both VLAN tagged and untagged frames from a receiving port to one or more transmitting ports. The Xpress-Pro SW 94000 switch performs multiple steps during the switching process:

- ◆ VLAN classification
- ◆ Learning
- ◆ Filtering
- ◆ Forwarding
- ◆ Aging

Below is additional information about tasks that the Xpress-Pro SW 94000 switch performs during unicast and multicast switching.

## UNICAST SWITCHING

### VLAN Classification

When the Xpress-Pro SW 94000 switch receives a frame, it classifies the frame in one of two ways:

If the frame is untagged, the Xpress-Pro SW 94000 switch classifies the frame to an associated VLAN.

If the frame is tagged, the Xpress-Pro SW 94000 switch uses the tagged VLAN ID to identify the broadcasting domain of the frame.

### Learning

After VLAN classification, the Xpress-Pro SW 94000 switch checks the <source MAC address, VLAN> pair in the switching database (SDB) to see whether the <source MAC address, VLAN> pair is known.

If it is unknown, the Xpress-Pro SW 94000 switch inserts the <source MAC address, VLAN> into the SDB and learns the <source MAC address, VLAN>.

If it is known, the Xpress-Pro SW 94000 switch checks the <source MAC address, VLAN> for a mismatched port ID. If the port ID associated with the <source MAC address, VLAN> pair in the SDB is different than the receiving port, the switch modifies the port ID in the SDB and modifies its management database (MDB) accordingly.

### Filtering

After learning the address, the Xpress-Pro SW 94000 switch checks:

Whether the source port or destination port is in the forwarding state.

Whether the source MAC address or destination MAC address is to be filtered.

Whether the source port ID is the same as destination port ID.

If any of these conditions are met, the Xpress-Pro SW 94000 switch drops the receiving packet. Otherwise, it continues with the forwarding process described below.

### Forwarding

During the forwarding process, the Xpress-Pro SW 94000 switch checks whether the <destination MAC address, VLAN> pair is unknown.

If it is unknown, the Xpress-Pro SW 94000 switch floods the receiving frame to all ports in the VLAN, excluding the source port.

If it is known, the Xpress-Pro SW 94000 switch forwards the receiving frame to the port associated with the <destination MAC address, VLAN> pair. At the same time, the Xpress-Pro SW 94000 switch ascertains the individual's port's VLAN tagging/untagging configuration and corresponding VLAN ID to render the appropriate frame tagging when the frame is ready to be transmitted.

## MULTICAST SWITCHING

For multicast switching, the Xpress-Pro SW 94000 switch checks whether the received frame is a BPDU. If a BPDU is received, the Xpress-Pro SW 94000 switch forwards the frame to the CPU for processing by the spanning tree protocol. Otherwise, the Xpress-Pro SW 94000 switch performs the following processes:

### VLAN classification

Same as for unicast switching.

### Learning

Same as for unicast switching.

### Filtering

After learning the address, the Xpress-Pro SW 94000 switch checks:

Whether the source port or destination port is not in the forwarding state.

Whether the source MAC address or destination MAC address is to be filtered.

If any of these conditions are met, the Xpress-Pro SW 94000 switch drops the receiving packet. Otherwise, it continues with the forwarding process described below.

### Forwarding

The Xpress-Pro SW 94000 switch floods the received multicast frame to all ports that are in forwarding state within the VLAN, excluding the source port. At the same time, the Xpress-Pro SW 94000 switch ascertains the individual port's VLAN tagging/untagging configuration and corresponding VLAN ID to render the appropriate frame tagging when the frame is ready to be transmitted.

### Aging

The Xpress-Pro SW 94000 switch performs the aging process for the <MAC addresses, VLAN> pair in the switching database. Once a <MAC address, VLAN> pair is aged out, the SDB is modified.

### Spanning Tree

The Xpress-Pro SW 94000 switch supports one Spanning Tree per bridged network.VLAN

A virtual LAN (VLAN) is a network of computers that behave as if they are connected to the same wire, even though they may actually be physically located on different segments of a LAN. VLANs are analogous to a group of end stations, perhaps on multiple physical LAN segments that are not constrained by their physical location and can communicate as if they were on a common LAN.

VLANs are configured through software rather than hardware, which makes them extremely flexible. One of the biggest advantages of VLANs is that when a computer is physically moved to another location, it can stay on the same VLAN without any hardware reconfiguration.

Because VLANs are not limited by the hardware constraints that physically connect traditional LAN segments to a network, they can define a network into various logical configurations. For example, VLANs can define a network by application. In this scenario, a company might create one VLAN for multimedia users and another for email users. VLANs can also define a network by department. For example, a company might have one VLAN for its Engineering Department, another for its Marketing Department, and another for its Account Payable Department.

VLANs can also be set up according to the organization structure within a company. For example, the company president might have his/her own VLAN, the executive staff might have a different VLAN, and the remaining employees might have yet a different VLAN.

As these examples show, VLANs offer unparalleled flexibility. The following sections describe how deploying VLANs can benefit organizations and reduce administration costs.

## Broadcast Containment

In traditional networks, traffic broadcasts to all network devices, whether they are the intended recipients or not. However, VLANs can be set up to contain only those devices that need to communicate with each other. As a result, VLANs significantly reduce network congestion. In addition, VLANs prevent broadcast storms from causing network meltdown due to volumes of traffic.

## Multicast-Based Multimedia Applications

Multimedia applications, such as interactive training, video conferencing, and news-video transmissions, require large amounts of bandwidth. These applications are also extremely sensitive to variable delays, which are unavoidable on a shared Ethernet network. By defining a VLAN based on the IP multicast address for all subscribing members on the VLAN, sufficient bandwidth will be available for these application, providing true multimedia on Ethernet.

## Enhanced Security

Because VLANs are self-contained, only the devices within the same VLAN can communicate with each other. If a device in one VLAN wants to communicate with a device in another VLAN, the traffic must go through a router.

## VLAN Membership

### VLAN implementation allows:

VLANs across multiple switches by using explicit or implicit tagging and the GARP/GVRP protocol defined in IEEE802.1p and 802.1Q.

An end station's network interface card may belong to multiple VLANs.

A switch port may be associated with multiple VLANs.

### Definitions of VLAN Membership

VLAN implementation allows VLAN membership to be defined based on ports. Port-based VLANs are organized by physical port number. For example, switch ports 1, 2, 4 and 6 can be grouped on VLAN, while server ports 3, 5, 7 and 8 can be on another VLAN. Broadcasts from servers within each group would only go to the members of its own VLAN. This ensures that broadcast storms cannot cause a network meltdown due to traffic volume.

### VLAN Membership Learning

Port-based VLAN is defined using a static binding between a VLAN and its associated ports. The switch's forwarding decision is based on the destination MAC address and its associated port ID. Therefore, to make valid forwarding and flooding decisions, the switch learns the relationship of the MAC address to its related port – and thus to the VLAN – at runtime.

### Remote VLAN Learning

In addition to providing network management tools that allow network administrators to statically add and delete VLAN member ports, the switch also supports GVRP (GARP VLAN Registration Protocol). GVRP allows for dynamic registration of VLAN port members within switch and across multiple switches.

Other than supporting dynamic updating of registration entries in a switch, GVRP is used to communicate VLAN registration information to other VLAN-aware switches, so that a VLAN member can cover a wide span of switches on a network.

GVRP allows both VLAN-aware workstations and switches to issue and revoke VLAN memberships. VLAN-aware switches register and propagate VLAN membership to all ports that belong to the active topology of the VLAN.

## VLAN CONFIGURATION

The Xpress-Pro SW 94000 switch provides a Local/Remote Management Console Interface for VLAN configuration and management. An SNMP-based VLAN MIB is also provided.

## Intra-VLAN Communication

The Xpress-Pro SW 94000 switch supports intra-VLAN communication through hardware, as described in “Basic Functions” section.

## Inter-VLAN Communication

The Xpress-Pro SW 94000 switch supports inter-VLAN communication using CPU-based routing software

## GVRP

In addition to network management tools that allow network administrators to statically add and delete VLAN member ports, the routing switch supports GARP VLAN Registration Protocol (GVRP). GVRP supports dynamic registration of VLAN port members within a switch and across multiple switches.

In addition to dynamically updating registration entries within a switch, GVRP is used to communicate VLAN registration information to other VLAN-aware switches, so that members of a VLAN can cover a wide span of switches on a network.

GVRP allows both VLAN-aware workstations and switches to issue and revoke VLAN memberships. VLAN-aware switches register and propagate VLAN membership to all ports that are part of the active topology of the VLAN.

## IGMP Snooping and IP Multicast Filtering

The Internet Group Management Protocol (IGMP) runs between hosts and their immediately neighboring multicast routers. The protocol's mechanisms allow a host to inform its local router that it wants to receive transmissions addressed to a specific multicast group.

Routers periodically query the LAN to determine if known group members are still active. If there is more than one router on the LAN performing IP multicasting, one of the routers is elected “querier” and assumes the responsibility of querying the LAN for group members.

Based on the group membership information learned from the IGMP, a router can determine which (if any) multicast traffic needs to be forwarded to each of its “leaf” sub-networks. Multicast routers use this information, along with a multicast routing protocol, to support IP multicasting across the Internet.

IGMP provides the final step in an IP multicast packet delivery service since it is only concerned with the forwarding of multicast traffic from the local route to group members on directly attached sub-networks.

Routing switches support IP Multicast Filtering by:

- ◆ Passively snooping on the IGMP Query and IGMP Report packets transferred between IP Multicast Routers and IP Multicast host groups to learn IP Multicast group members, and
- ◆ Actively sending IGMP Query messages to solicit IP Multicast group members.

The purpose of IP multicast filtering is to optimize a switched network's performance, so multicast packets will only be forwarded to those ports containing multicast group hosts members and routers instead of flooding to all ports in the subnet (VLAN).

Routing switches with IP multicast filtering/switching capability not only passively monitor IGMP Query and Report messages, DVMRP Probe messages, PIM, and MOSPF Hello messages; they also actively send IGMP Query messages to learn locations of multicast routers and member hosts in multicast groups within each VLAN.

Note, however, IGMP neither alters nor routes any IP multicast packets. Since IGMP is not concerned with the delivery of IP multicast packets across sub-networks, an external IP multicast router is needed if IP multicast packets have to be routed across different sub-networks.

## Switch Management

### Administration console via RS-232 serial port

The Xpress-Pro SW 94000 switch provides an onboard serial port, which allows the switch to be configured via a directly connected terminal or a Telnet session.

### Web-based browser interface

The Xpress-Pro SW 94000 switch also hosts a point-and-click browser-based interface that lets users access full switch configuration and functionality from a Netscape or Internet Explorer browser.

### External SNMP-based network management application

The Xpress-Pro SW 94000 switch can also be configured via SNMP. For more information on switch management, refer to the "Switch Management" section.



## 3: Installation

This chapter gives step-by-step instructions about how to install the Xpress-Pro SW 94000 switch:

### Selecting a Site for the Switch

As with any electric device, you should place the s Xpress-Pro SW 94000 witch where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

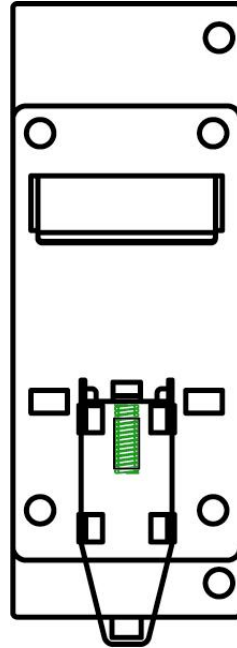
- ◆ The ambient temperature should be between -34 to 74 degrees Celsius.
- ◆ The relative humidity should be less than 95 percent, non-condensing.
- ◆ Surrounding electrical devices should not exceed the electromagnetic field (RFC) standards.
- ◆ Make sure that the Xpress-Pro SW 94000 switch receives adequate ventilation. Do not block the ventilation holes on each side of the s Xpress-Pro SW 94000 witch or the fan exhaust port on the rear of the Xpress-Pro SW 94000 switch.
- ◆ The power outlet should be within 1.8 meters of the Xpress-Pro SW 94000 switch.

### DIN Rail Mounting

Fix the DIN rail attachment plate to the back panel of the Xpress-Pro SW 94000 switch.

Installation: Place the Xpress-Pro SW 94000 switch on the DIN rail from above using the slot. Push the front of the Xpress-Pro SW 94000 switch toward the mounting surface until it audibly snaps into place.

Removal: Pull out the lower edge and then remove the Xpress-Pro SW 94000 switch from the DIN rail.

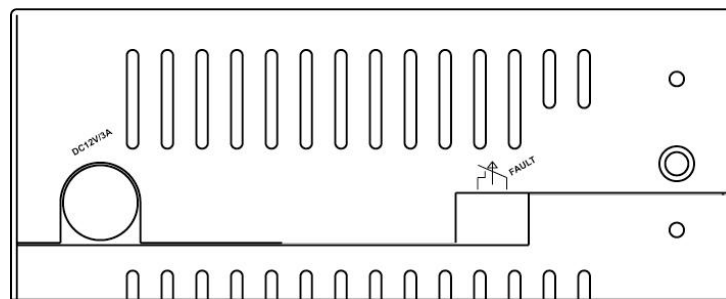


## Connecting to Power

Redundant DC Terminal Block Power Inputs or 12VDC DC Jack:

### 12VDC DC Jack

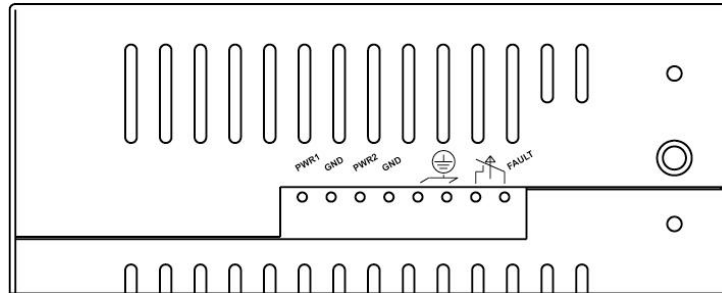
1. Connect the supplied AC to DC power adapter to the receptacle on the topside of the Xpress-Pro SW 94000 switch.
2. Connect the power cord to the AC to DC power adapter and attach the plug into a standard AC outlet with the appropriate AC voltage.



### Redundant DC Terminal Block Power Inputs



There are two pairs of power inputs for use with redundant power sources. You only need to have one power input connected to run the Xpress-Pro SW 94000 switch.

1. Connect the DC power cord to the plug-able terminal block on the Xpress-Pro SW 94000 switch, and then plug it into a standard DC outlet.
2. Disconnect the power cord if you want to shut down the Xpress-Pro SW 94000 switch.



### Alarms for Power Failure

1. There are two pins on the terminal block used for power failure detection. It provides the normally closed output when the power source is active. Use this as a dry contact application to send a signal for power failure detection.

| The Terminal Block  |  |
|---|--|
| PWR1  | Power Input 1 (+24VDC)                     |
| GND   | Power Ground                               |
| PWR2  | Power Input 2 (+24VDC)                     |
| GND   | Power Ground                               |
|  | Earth Ground                               |
|  | The relay opens if PWR1 or PWR2 fails (1A) |

**Caution:** The relay output is normal open position when there is no power to the Xpress-Pro SW 94000 switch. Please do not connect any power source to this terminal to prevent shorting your power supply.

### Power-on Self test (POST)

The Xpress-Pro SW 94000 Switch performs its Power-On Self Test (POST) when the power is switched on. During the POST, the Xpress-Pro SW 94000 switch CPU will:

Perform a series of diagnostic procedures to make sure the basic system is functioning properly.

A command line prompts when you press the Esc key on a terminal connected to the Xpress-Pro SW 94000 switch serial port during the POST process. Then you can execute the following options:

#### Download runtime software from serial port0

This will download the runtime system image to the Xpress-Pro SW 94000 switch via the serial port. Before selecting this option, make sure:

A host system is running a terminal emulation program that supports the Kermit file transfer protocol.

The host system's hard drive has the required binary file that will be downloaded to the Xpress-Pro SW 94000 switch.

### Configure the system

This option lets you modify any configurable parameter in the switch's flash ROM before the Xpress-Pro SW 94000 switch system boots.

### Run manufacturing diagnostics

This option is to download the manufacturer's diagnostics. Refer to Download Runtime Software for download requirements.

When the file transfer is completed, the target system jumps to the entry point of the diagnostic program and starts executing the diagnostic code. The Main Menu of the diagnostic program appears where you can initiate tests or obtain system information. Note that user intervention is not required when a test runs, unless an error occurs. If an error occurs during testing, you are given the choice of continuing the diagnostics or skip the error.

## Connecting to Your Network

### Cable Type & Length

It is necessary to follow the cable specifications below when connecting the Xpress-Pro SW 94000 switch to your network. Use appropriate cables that meet your speed and cabling requirements.

Cable Specifications

| Speed      | Connector | Port Speed<br>Half/Full Duplex | Cable                       | Max.<br>Distance |
|------------|-----------|--------------------------------|-----------------------------|------------------|
| 10BaseT    | RJ-45     | 10/20 Mbps                     | 2-pair UTP/STP Cat. 3, 4, 5 | 100 m            |
| 100BaseTX  | RJ-45     | 100/200 Mbps                   | 2-pair UTP/STP Cat. 5       | 100 m            |
| 1000BaseT  | RJ-45     | 2000 Mbps                      | 4-pair UTP/STP Cat. 5       | 100 m            |
| 100BaseFX  | ST, SC    | 100/200 Mbps                   | MMF (50 or 62.5µm)          | 2 km             |
| 100BaseFX  | ST, SC    | 100/200 Mbps                   | SMF (9 or 10µm)             | 15, 40, or 75 km |
| 1000BaseSX | SC        | 2000 Mbps                      | MMF (50 or 62.5µm)          | 550 m            |
| 1000BaseLX | SC        | 2000 Mbps                      | SMF (9 or 10µm)             | 10, 20, or 60 km |

## Cabling

1. First, ensure the power of the Xpress-Pro SW 94000 switch and end devices is turned off.

**Note:** Always ensure that the power is off before any installation.

2. Prepare cable with corresponding connectors for each type of port in use.

**Note:** To connect two regular RJ-45 ports between switches or hubs, you need a cross-over cable.

3. Consult Table 3 in previous section for cabling requirements based on connectors and speed.
4. Connect one end of the cable to the Xpress-Pro SW 94000 switch and the other end to a desired device.
5. Once the connections between two end devices are made successfully, turn on the power and the Xpress-Pro SW 94000 switch is operational.

## 4: Switch Management

This chapter explains the methods that you can use to configure management access to the Xpress-Pro SW 94000 switch. It describes the types of management applications and the communication and management protocols that deliver data between your management device (workstation or personal computer) and the system. It also contains information about port connection options.

This chapter covers the following topics:

- ◆ Management Access Overview
- ◆ Key Concepts
- ◆ Key Guidelines for Implementation
- ◆ Administration Console Access
- ◆ Web Management Access
- ◆ SNMP Access
- ◆ Standards, Protocols, and Related Reading

### Management Access Overview

The Xpress-Pro SW 94000 switch gives you the flexibility to access and manage the Xpress-Pro SW 94000 switch using any or all of the following methods.

The administration console and web browser interface support are embedded in the Xpress-Pro SW 94000 switch software and are available for immediate use.

#### Administration console via RS-232 serial port

##### Advantages

- ◆ No IP address or subnet needed
- ◆ Text-based
- ◆ Telnet functionality and HyperTerminal built into Windows
- ◆ 95/98/NT/2000 operating systems

##### Disadvantages

- ◆ Must be near switch or use dial-up connection
- ◆ Inconvenient for remote users
- ◆ Modem connection may prove to be unreliable or slow

## Web-based browser interface

### Advantages

- ◆ Ideal for configuring the Xpress-Pro SW 94000 switch remotely
- ◆ Compatible with all popular browsers
- ◆ Can be accessed from any location
- ◆ Most visually appealing

### Disadvantages

- ◆ Security can be compromised (hackers need only know the IP address and subnet mask)
- ◆ May encounter lag times on poor connections

## External SNMP-based network management application

### Advantages

- ◆ Communicates with the s Xpress-Pro SW 94000 witch functions at the MIB level
- ◆ Based on open standards

### Disadvantages

- ◆ Requires SNMP manager software
- ◆ Least visually appealing of all three methods
- ◆ Some settings require calculations
- ◆ Security can be compromised (hackers need only know the community name)

## Administration Console

The administration console is an internal, character-oriented, menu-driven user interface for performing system administration such as displaying statistics or changing option settings.

Using this method, you can view the administration console from a terminal, personal computer, Apple Macintosh, or workstation connected to the Xpress-Pro SW 94000 switch's console port.

There are two ways to use this management method: direct access or modem access. The following sections describe these methods.

### Direct Access

Direct access to the administration console is achieved by directly connecting a terminal or a PC equipped with a terminal-emulation program (such as HyperTerminal) to the Xpress-Pro SW 94000 switch console port.

When using the management method, configure the terminal-emulation program to use the following parameters (you can change these settings after login):

- ◆ [Default parameters]
- ◆ 115,200bps
- ◆ 8 data bits
- ◆ No parity
- ◆ 1 stop bit

This management method is often preferred because you can remain connected and monitor the system during system reboots. Also, certain error messages are sent to the serial port, regardless of the interface through which the associated action was initiated. A Macintosh or PC attachment can use any terminal-emulation program for connecting to the terminal serial port. A workstation attachment under UNIX can use an emulator such as TIP.

### Modem Access

You can access the Xpress-Pro SW 94000 switch's administration console from a PC or Macintosh using an external modem attached to the console port. The Xpress-Pro SW 94000 switch management program provides Console Port screen, accessible from the Basic Management screen, which lets you configure parameters for modem access.

When you have configured the external modem from the administration console, the Xpress-Pro SW 94000 switch transmits characters that you have entered as output on the modem port. The Xpress-Pro SW 94000 switch echoes characters that it receives as input on the modem port to the current administration console session. The console appears to be directly connected to the external modem.

## Web Management

The Xpress-Pro SW 94000 switch provides a browser interface that lets you configure and manage the switch remotely.

After you set up your IP address for the switch, you can access the Xpress-Pro SW 94000 switch's web interface applications directly in your web browser by entering the IP address of the Xpress-Pro SW 94000 switch. You can then use your web browser to list and manage switch configuration parameters from one central location, just as if you were directly connected to the Xpress-Pro SW 94000 switch's console port.

Web Management requires either Microsoft Internet Explorer 4.01 or later or Netscape Navigator 4.03 or later.

### Netscape Navigator

If you use Netscape Navigator 4.03 or 4.04, install the Netscape JDK 1.1 Patch. Download the patch from:

<http://help.netscape.com/filelib.html#smartupdate>

If you encounter problems accessing Help files when you use Netscape, clear the browser memory cache and disk cache, and restart the browser.



### Internet Explorer

If you use Internet Explorer, install the latest 4.01 Service Pack 1. This service pack makes Internet Explorer Year 2000 compliant and fixes other product-support issues. Download the 4.01 Service Pack 1 from the following location:

[http://www.microsoft.com/msdownload/iebuild/ie4sp1\\_win32/en/ie4sp1\\_win32.htm](http://www.microsoft.com/msdownload/iebuild/ie4sp1_win32/en/ie4sp1_win32.htm)

If the above link is unavailable, download the service pack from the Microsoft home page:

<http://www.microsoft.com>

## SNMP-Based Network Management

You can use an external SNMP-based application to configure and manage the Xpress-Pro SW 94000 switch. This management method requires the SNMP agent on the Xpress-Pro SW 94000 switch and the SNMP Network Management Station to use the same community string. This management method, in fact, uses two community strings: the get community string and the set community string. If the SNMP Network management station only knows the set community string, it can read and write to the MIBs. However, if it only knows the get community string, it can only read MIBs. The default get and set community strings for the Xpress-Pro SW 94000 switch are public.

## Protocols

The Xpress-Pro SW 94000 switch supports the following protocols:

### Virtual terminal protocols, such as Telnet

A virtual terminal protocol is a software program, such as Telnet, that allows you to establish a management session from a Macintosh, a PC, or a UNIX workstation. Because Telnet runs over TCP/IP, you must have at least one IP address configured on the Xpress-Pro SW 94000 switch before you can establish access to it with a virtual terminal protocol.

**Note:** Terminal emulation is different from a virtual terminal protocol in that you must connect a terminal directly to the console port.

### Simple Network Management Protocol (SNMP)

SNMP is the standard management protocol for multivendor IP networks. SNMP supports transaction-based queries that allow the protocol to format messages and to transmit information between reporting devices and data-collection programs. SNMP runs on top of the User Datagram Protocol (UDP), offering a connectionless-mode service.

## Management Architecture

All of the management application modules use the same Messaging Application Programming Interface (MAPI). By unifying management methods with a single MAPI, configuration parameters set using one method (e.g. console port) are immediately displayed the other management methods (e.g. SNMP agent of web browser).

The management architecture of the Xpress-Pro SW 94000 switch adheres to the IEEE open standard. This compliance assures customers that the Xpress-Pro SW 94000 switch is compatible with, and will interoperate with other solutions that adhere to the same open standard.

## 5: Menu-Driven Console Management

The Xpress-Pro SW 94000 switch provides a menu-driven console interface for configuration purposes. The Xpress-Pro SW 94000 switch can be configured either locally through its RS-232 port or remotely via a Telnet session.

This chapter describes how to configure the Xpress-Pro SW 94000 switch using its menu-driven console.

### Logging on to the switch

#### At the screen prompt

Switch Console Login:

Password:

#### Login name

Enter the console interface factory default console name **admin**.

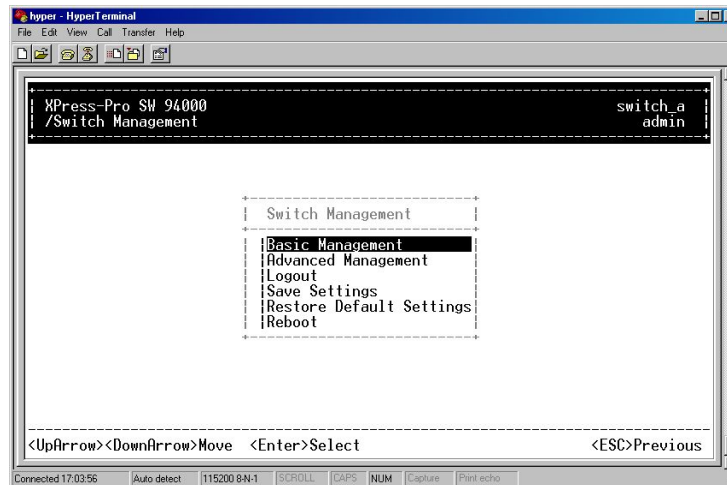
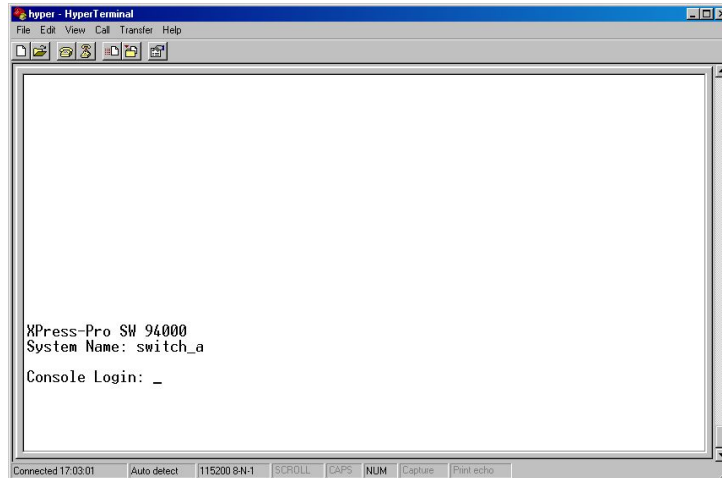
#### Password

Enter the factory default password (no password, **press <Enter> directly**). Or enter a user-defined password if you followed the instructions later and changed the factory default password.

**Factory Default Password:** no password, press **<Enter>** directly.

**Note:** Only one console and three telnet users can log on to the Xpress-Pro SW 94000 switch concurrently. However, it is not recommended that multiple users modify the configuration at the same time.

## Switch Management Screen



### Basic Management

Refer to performing basic management activities.

### Advanced Management

Refer to performing advanced management activities.

### Logout

Highlight this option and press Enter to log out.

### Save Settings

Highlight this option and press Enter to save the current settings and remain in the configuration program.

### Restore Default Settings

Highlight this option and press Enter to restore the factory default settings.

### Reboot

Highlight this option and press Enter to reboot.

## Navigating Through the Console Interface

The console interface consists of a series of menu boxes. Each menu box has several options, which are listed vertically. Move the highlight to select an option as you wish; press the Enter key to activate that option.

| Press this key... | To   |
|-------------------|--|
| Up Arrow or K*    | Move the highlight one line up in a menu box   |
| Down Arrow or J*  | Move the highlight one line down in a menu box |
| Tab               | Move the highlight between screens             |
| Enter             | Select the highlighted option                  |
| Esc               | Move to a previous menu                        |

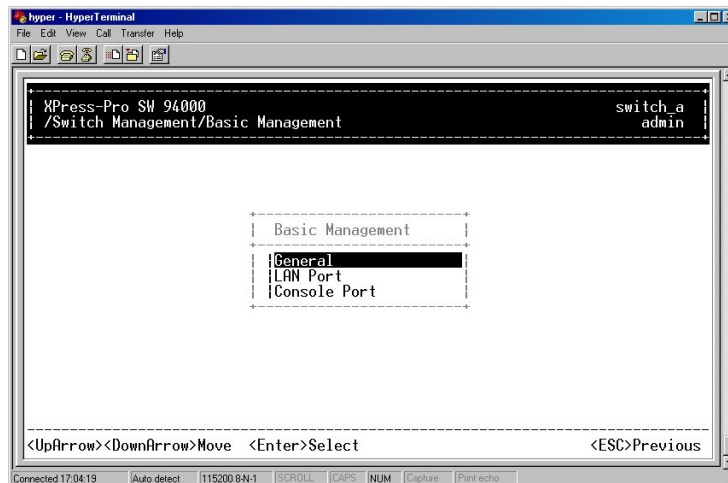
**Note:**\* Remember to release the <Caps Lock> key if you press <K> or <J> and cannot move the highlight on the screen.

## Performing Basic Management Activities

Basic management activities consist of General, LAN Port, and Console Port tasks.

### To Perform Basic Management Activities:

1. Highlight **Basic Management** from **Switch Management** screen and press <Enter>. The **Basic Management** screen appears:



2. Highlight a desired option and press <Enter>. Or press <Esc> to exit.

## General Management Configurations

1. Highlight **General** from **Basic Management** screen and press <Enter>.

```

hyper - HyperTerminal
File Edit View Call Transfer Help
-----
XPress-Pro SW 94000                               switch_a
/Switch Management/Basic Management/General        admin

-----
General
-----
Hardware Revision: 300030 Rev.0
Hardware Configuration: eqm1g8.rom
Software Revision: v1.3 (Jul 26 2006 15:27:28)
Firmware Revision: No Firmware

System Name: switch_a
Contact:
Location:
admin Password: *****
guest Password: *****
Statistics Collection: Disabled
Reboot-On-Error: Enabled
Remote Telnet Login: Enabled
Remote HTTP Login: Enabled

<UpArrow><DownArrow>Move  <Enter>Modify          <ESC>Previous
-----
Connected 17:04:48  Auto detect  [115200 8-N-1]  SCROLL  CAPS  NUM  Capture  Print echo

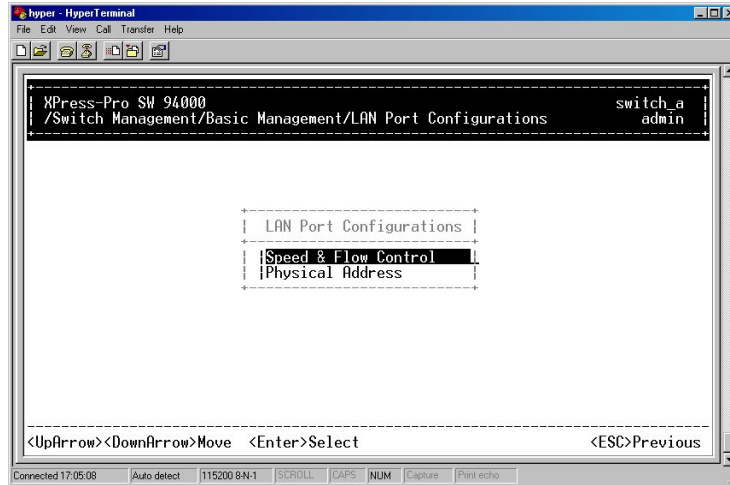
```

**System Name** is highlighted. Press <Enter> if you want to change it.

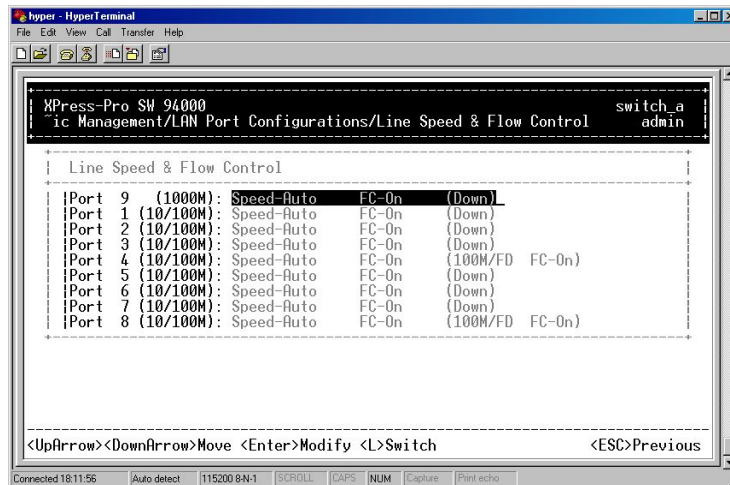
2. Move to highlight **Contact** and press <Enter> if you want to change it.
3. Move to highlight **Location** and press <Enter> if you want to change it.
4. Move to highlight **admin Password** and press <Enter> if you want to change it.
5. Move to highlight **guest Password** and press <Enter> if you want to change it.
6. Move to highlight **Statistics Collection** and press <Enter> if you want to change it, Disabled or Enabled.
7. Move to highlight **Reboot-On-Error** and press <Enter> if you want to change it, Disabled or Enabled.
8. Move to highlight **Remote Telnet Login** and press <Enter> if you want to change it, Disabled or Enabled.
9. Move to highlight **Remote HTTP Login** and press <Enter> if you want to change it, Disabled or Enabled.
10. Press <Esc> to return to **Basic Management** screen when completed.

### LAN Port Configurations

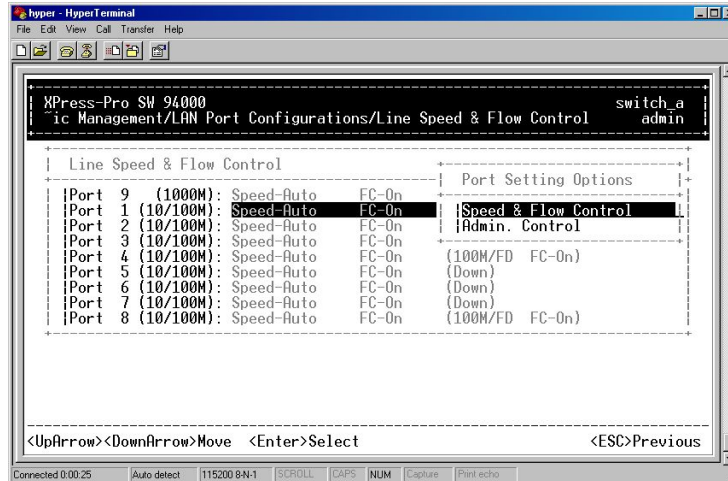
1. Highlight **LAN Port** from **Basic Management** screen and press <Enter>.



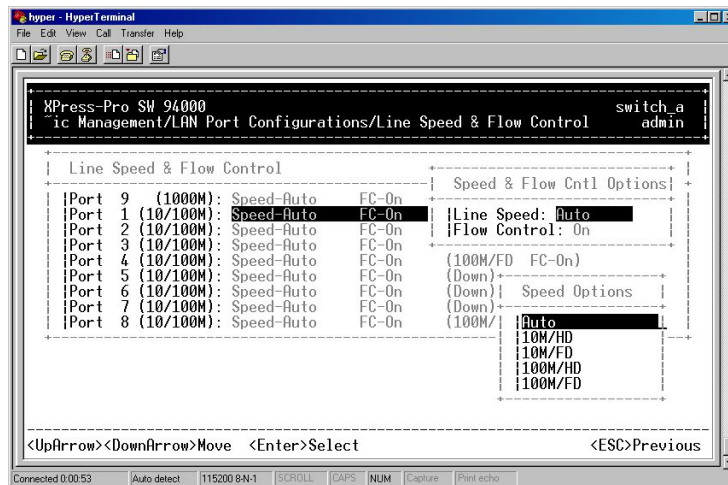
2. **Speed & Flow Control** is highlighted. Press <Enter> if you want to set speed or flow control on port.
3. Move to highlight each port and press <Enter> to configure individually.



4. **Port Setting Options** screen appears. Highlight **Speed & Flow Control** and press <Enter>.



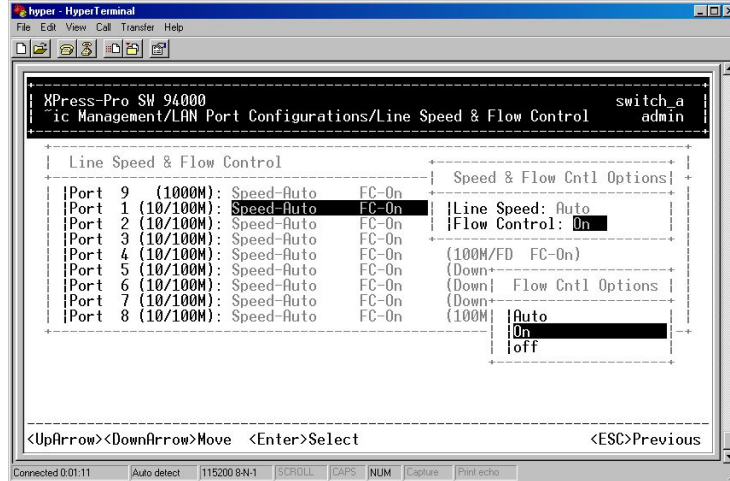
5. For **Line Speed**, move to highlight a desired setting from **Speed Options** and press <Enter>.



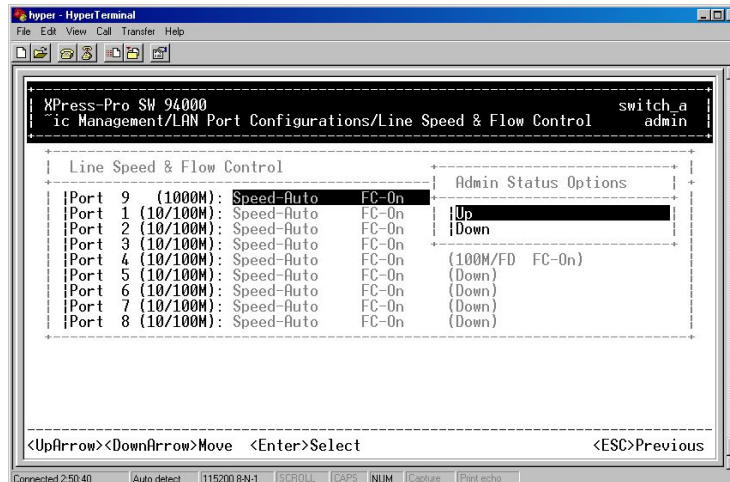
**Note:** In the Speed Options, HD denotes half-duplex and FD denotes full-duplex.

6. Press <Esc> to previous screen. Highlight **Flow Control** and press <Enter>.
7. For **Flow Control**, move to highlight a desired setting from the **Flow Cntl Options** and press <Enter>.

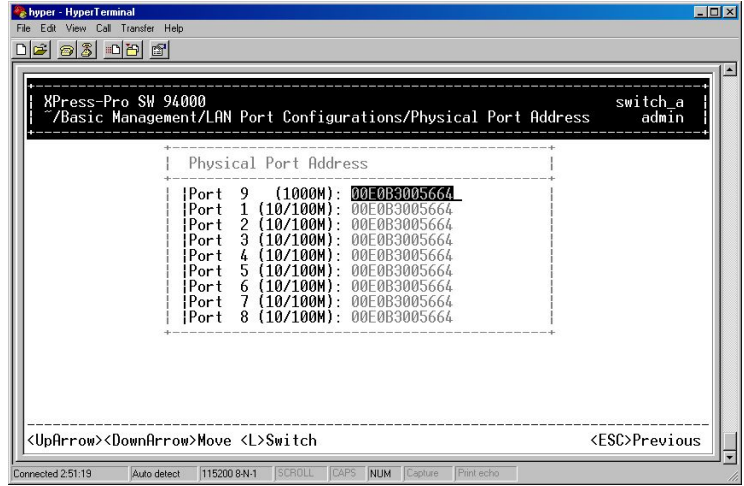




8. Press <Esc> to a previous screen as shown in step 3.
9. For **Admin. Control**, move to highlight Up or Down from **Admin Status Options**.



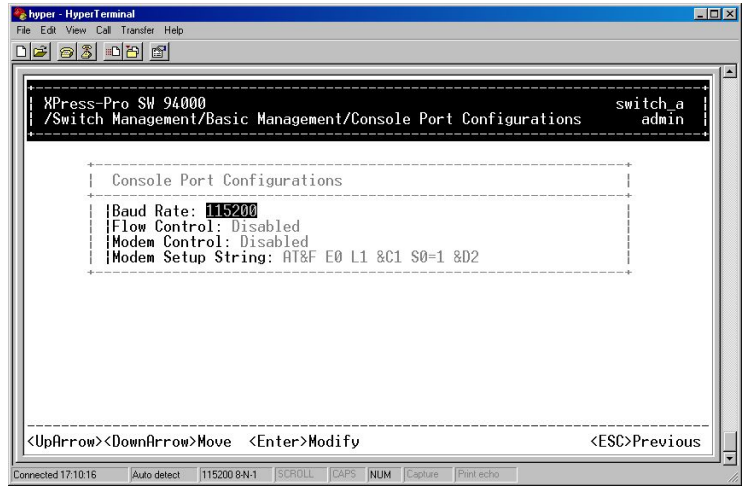
10. The port is set as **Admin Down** to stop TX/RX transmission.
11. To allow TX/RX transmission on the port, move to highlight Up from the options in step 9.
12. Press <Esc> to a previous screen as shown in step 1.
13. Move to highlight **Physical Address** to view physical port address.



14. Press <Esc> to return to **Basic Management** screen when completed.

### Console Port Configurations

1. Move to highlight **Console Port** from **Basic Management** screen.



2. **Baud Rate** is highlighted. Press <Enter> if you want to change the current console baud rate.
3. Move to highlight **Flow Control** and press <Enter> if you want to change the current flow control method.
4. Move to highlight **Modem Control** and press <Enter> to decide a console modem connection, Disabled or Enabled.
5. When a modem connection is enabled, move to highlight **Modem Setup String** and press <Enter>. Decide whether you want to use Default or Custom Setup String.

**Note:** Default Setup String configures the modem to auto answer. It works for all.

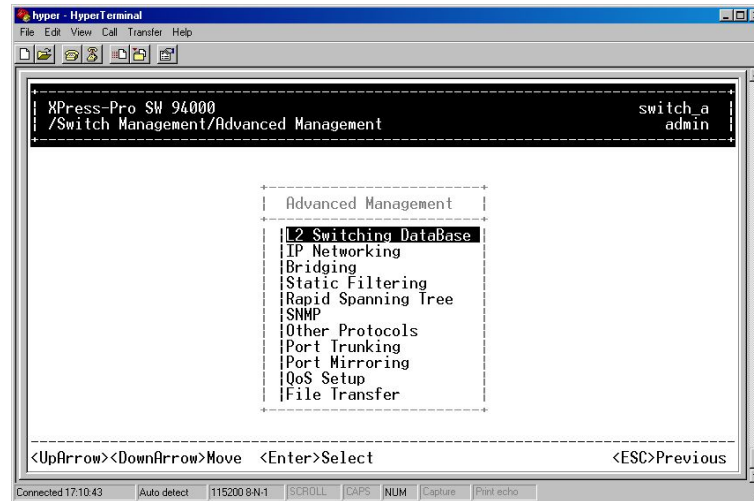
6. Press <Esc> to return to **Basic Management** screen when completed.

## Performing Advanced Management Activities

Advanced management activities consist of L2 Switching DataBase / IP Networking / Bridging / Static Filtering / Rapid Spanning Tree / SNMP / Other Protocols / Port Trunking / Port Mirroring / QoS Setup / File Transfer.

### To Perform Advanced Management Activities:

1. Highlight **Advanced Management** from **Switch Management** screen and press <Enter>. The **Advanced Management** screen appears:



15. Move to highlight a desired option and press <Enter>. Or press <Esc> to exit.

### L2 Switching DataBase

View and change VLAN, MAC address, IP multicast group, and port perspectives.

### IP Networking

View and change IP settings and ping settings.

### Bridging

View and change the aging period for a MAC address and the flood limit for all ports.

### Static Filtering

View / add / delete / search all source or destination MAC addresses to be filtered.

### rapid Spanning Tree

View and change spanning tree configurations, ports states, path costs, and port priorities.

### SNMP

View and change the SNMP configuration.

**Other Protocols**

View and change GVRP and IGMP settings.

**Port Trunking**

Assign a range of ports to trunking groups.

**Port Mirroring**

Mirror one port to Port 1.

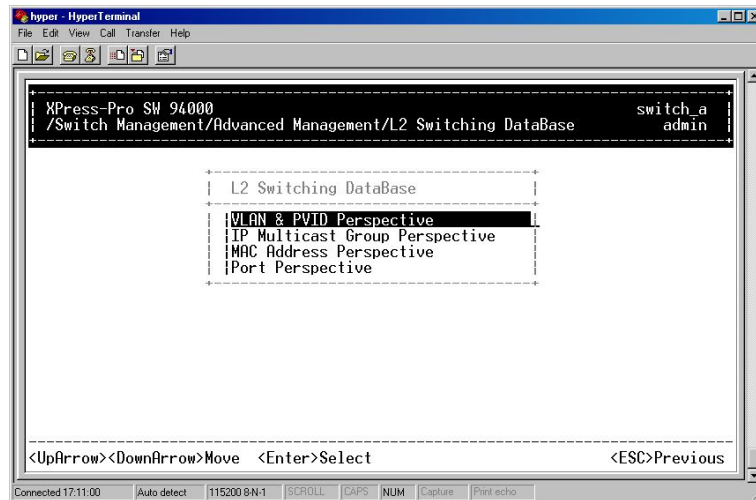
**qos setup**

Specify Quality of Service parameter.

**File Transfer**

Send files using the TFTP or Kermit protocol.

**L2 Switching DataBase**



**VLAN & PVID Perspective**

There are three types of private VLAN ports: promiscuous, isolated, and community.

A promiscuous port communicates with all other private VLAN ports and is the port you use to communicate with routers, servers, and administrative workstations.

An isolated port has complete Layer 2 separation from other ports within the same private VLAN with the exception of the promiscuous port.

Community ports communicate among themselves and with their promiscuous ports. These ports are isolated at Layer 2 from all other ports in other communities or isolated ports within their private VLAN.

Primary VLAN conveys incoming traffic from the promiscuous port to all other promiscuous, isolated, and community ports.

Isolated VLAN used by isolated ports to communicate to the promiscuous ports.

## ***5: Menu-Driven Console Management***

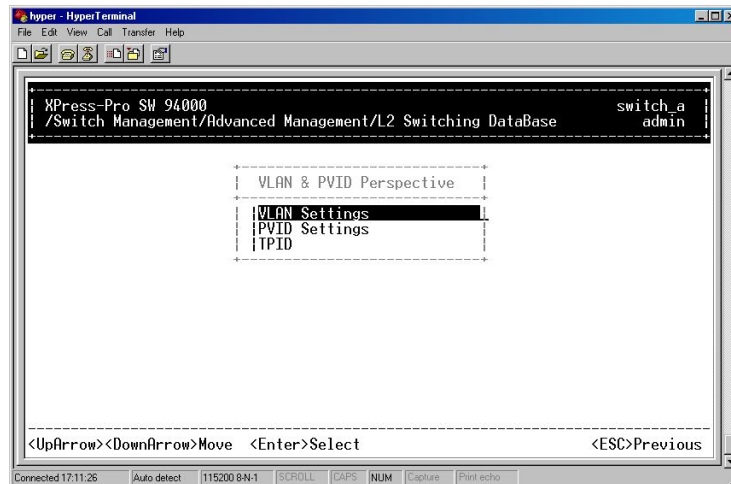
Community VLAN used by a group of community ports to communicate among themselves and transmit traffic to outside the group via the designated promiscuous port.

For example:

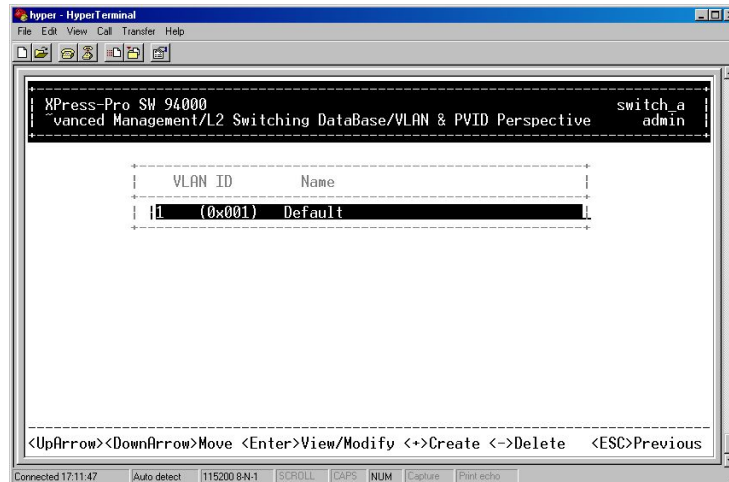
|                | VLAN ID | Promiscuous port | Isolated port | Community ports |
|----------------|---------|------------------|---------------|-----------------|
| Primary VLAN   | 2       | 2                | 3,4           | 5,6,7,8         |
| Isolated VLAN  | 3       | 2                | 3             |                 |
| Isolated VLAN  | 4       | 2                | 4             |                 |
| Community VLAN | 5       | 2                |               | 5,6             |
| Community VLAN | 6       | 2                |               | 7,8             |

1. Create the primary VLAN and bind the promiscuous port, isolated port(s), and community ports to the primary VLAN.
2. Create the isolated VLAN(s) and bind the promiscuous port and isolated port(s) to the isolated VLAN(s).
3. Create the community VLAN(s) and bind the promiscuous port and community ports to the community VLAN(s).
4. Associate the primary VLAN to the promiscuous port.
5. Associate the isolated VLAN(s) to the isolated port(s).
6. Associate the community ports to the community VLAN(s).

1. Highlight the **VLAN & PVID Perspective** and press <Enter>.



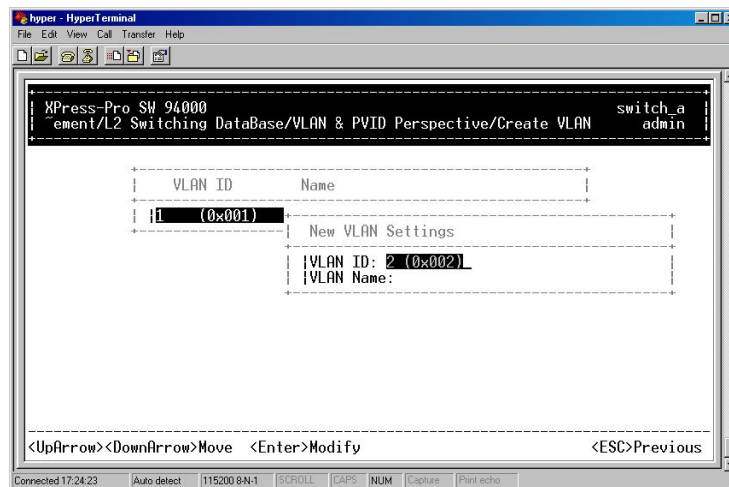
2. Highlight the **VLAN Settings** and press <Enter> to view VLAN info of the default VLAN or if you want to obtain a VLAN perspective instead of the default VLAN.



**Note:** Default VLAN:

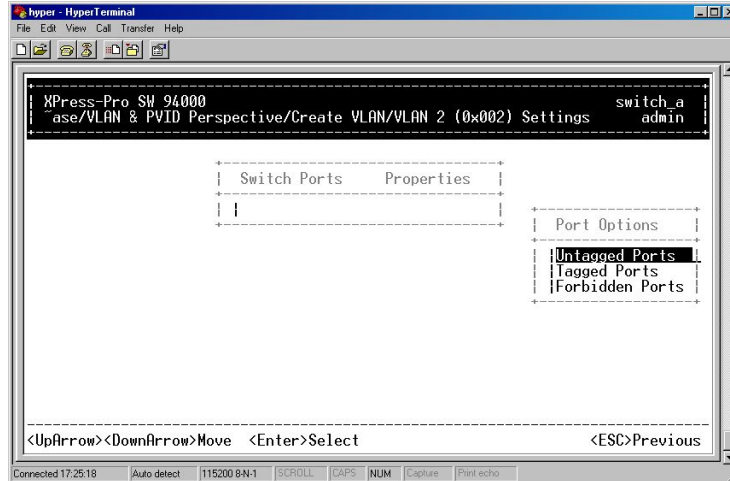
The IEEE802.1Q standard defines VLAN ID #1 as the default VLAN. The default VLAN includes all the ports as the factory default. The default VLAN's egress rule restricts the ports to be all untagged, so it can, by default, be easily used as a simple 802.1D bridging domain. The default VLAN's domain shrinks as untagged ports are defined in other VLANs.

3. Press <Shift> and [+] **on keypad to enter New VLAN Settings**. Enter new VLAN ID and VLAN name.



**Note:** "Remote" is appended to the VLAN ID automatically if the VLAN is learned from a remote switch.

4. Press <Esc> and appears the following screen. Press <Shift> and [+] **to add new switch ports to the newly created VLAN**.

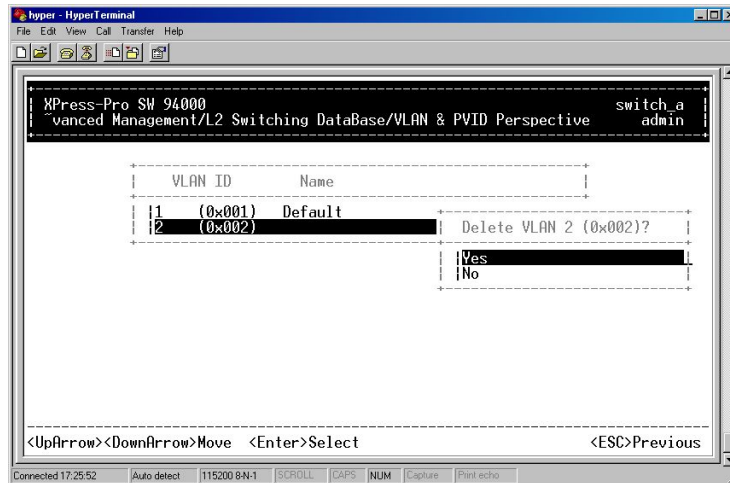


5. Move to highlight a suitable option from **Port Options** and press <Enter>, e.g. Untagged Ports.
6. From **Select Untagged Ports**, press <Enter> to select All Ports or move to highlight each port individually and press <Enter>. Similar procedure when you select Tagged Ports and Forbidden Ports in step 4.

**Note:** If you added untagged ports and want to now add tagged ports or forbidden ports, or vice versa, repeat steps 4 and 5.

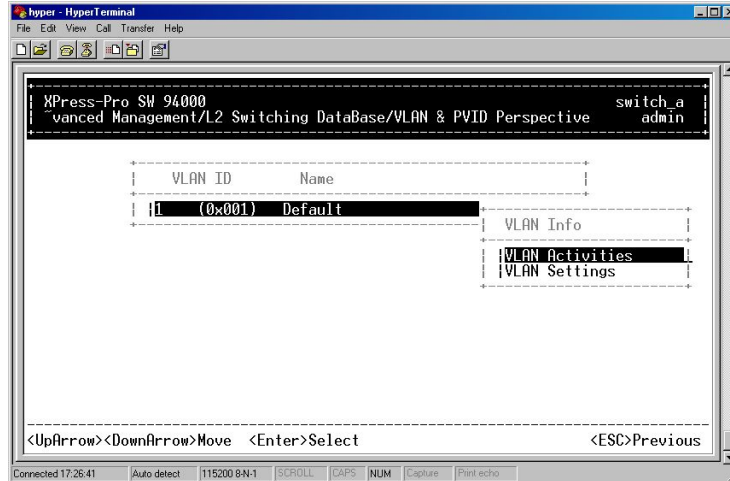
7. Press <Esc> to a previous screen as shown in step 1.
8. Delete VLAN: highlight a VLAN ID and press [-] to delete it.

Note that you cannot delete the default VLAN.

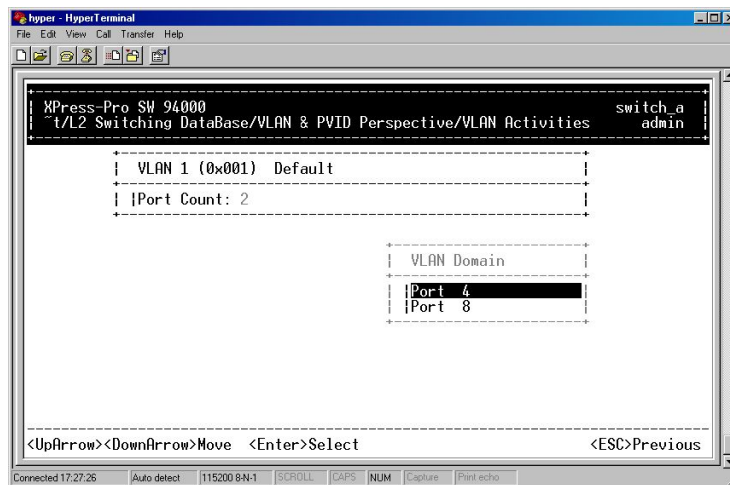


9. Press <Esc> to a previous screen as shown in **Step 1** when completed with deleting a VLAN.
10. Highlight an existing VLAN and press <Enter> to view VLAN information.

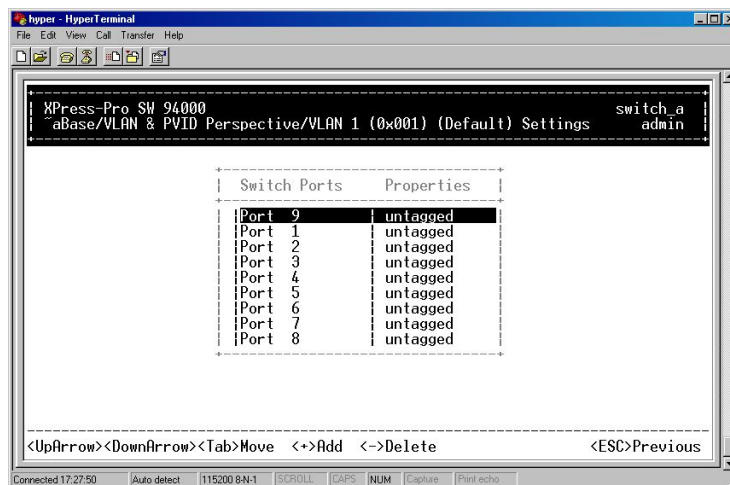




11. Move to highlight **VLAN Activities** and press <Enter> to view or search activity information.

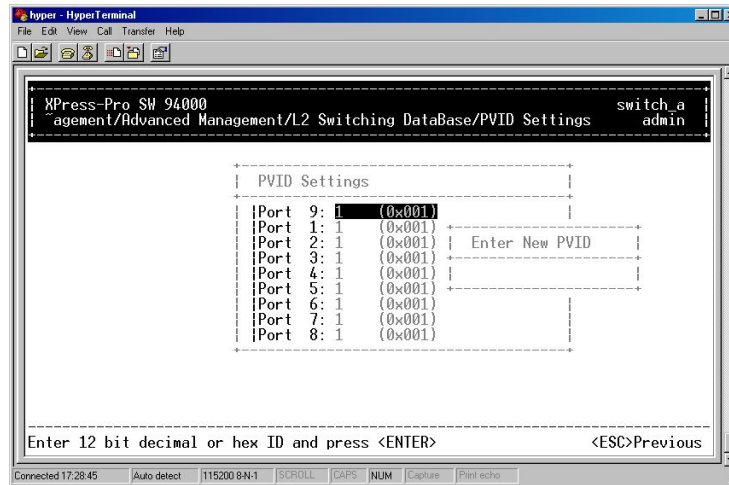


12. Return to Step 9 Move to highlight VLAN Settings and press <Enter>. The screen appears as shown in Step 3 for adding or deleting switch ports.

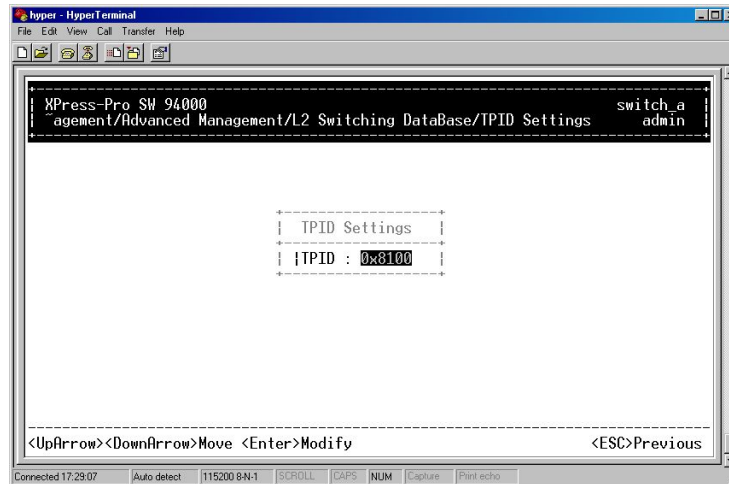


13. Highlight the **VLAN & PVID Perspective** and press <Enter>.

- Highlight the **PVID Settings** and press <Enter> to apply PVIDs to the ports.



- Highlight the port and press <Enter> to enter PVID to the port.
- Highlight the **VLAN & PVID Perspective** and press <Enter>.
- Highlight the **TPID** and press <Enter>.



- Press <Enter> to enter TPID value.

#### IP Multicast Group Perspective

- Move to highlight **L2 Switching DataBase** from **Advanced Management** screen and press <Enter>.
- Move to highlight **IP Multicast Group Perspective** from **L2 Switching DataBase** screen and press <Enter>.
- Move to highlight an address to view information associated with this IP multicast group.

#### MAC Address Perspective

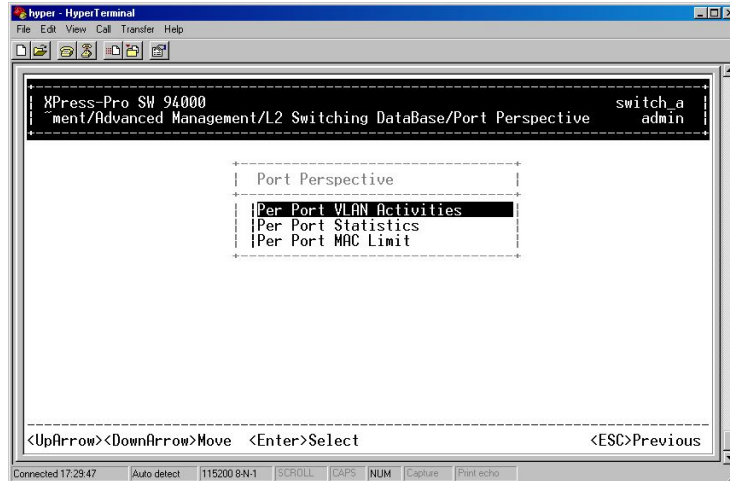
- Move to highlight **MAC Address Perspective** from **L2 Switching DataBase** screen, and press <Enter>.

2. Enter a MAC address to view characteristics information, corresponding VLANs, and corresponding ports in the switching database.

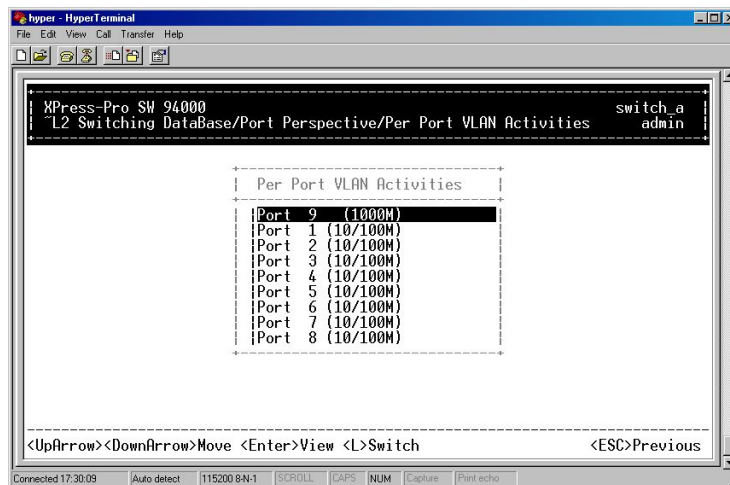
Port Perspective

1. Move to highlight **Port Perspective** from **L2 Switching DataBase** screen, and press <Enter>.

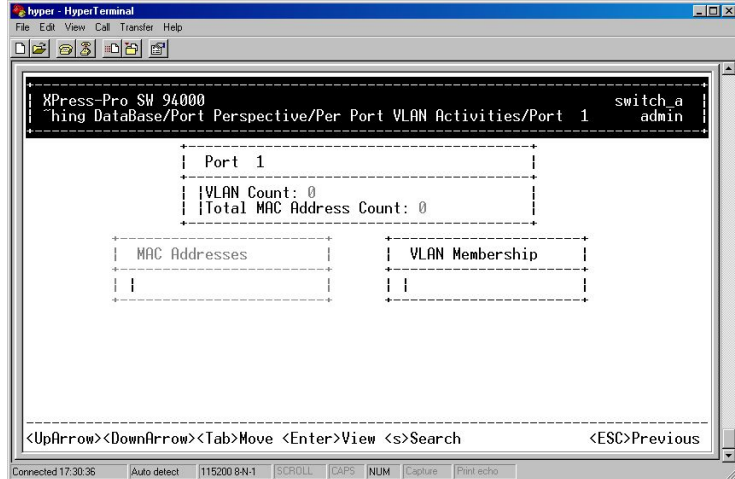
You can view Per Port VLAN activities and Per Port statistics and set Per Port MAC Limit here.



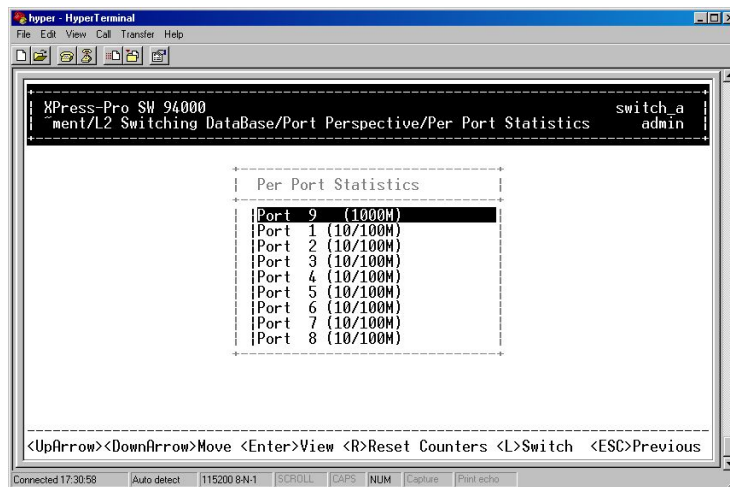
2. **Per Port VLAN Activities** is highlighted. Press <Enter>.



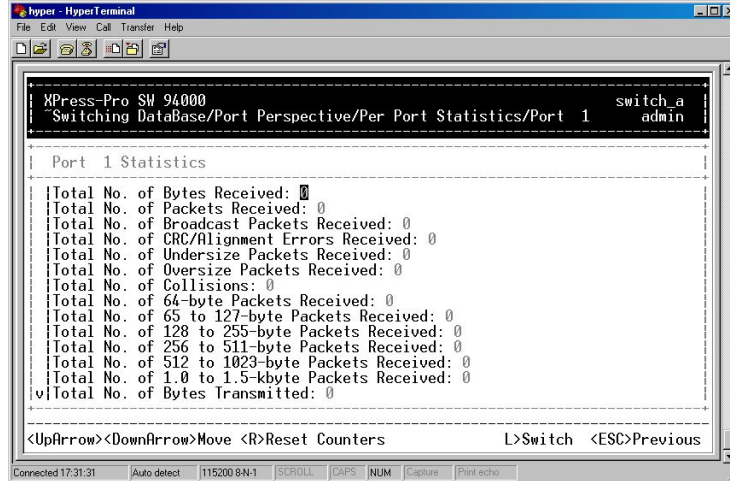
3. Move to highlight a port and press <Enter>. (E.g. select Port 1 to view corresponding VLAN Activities.)



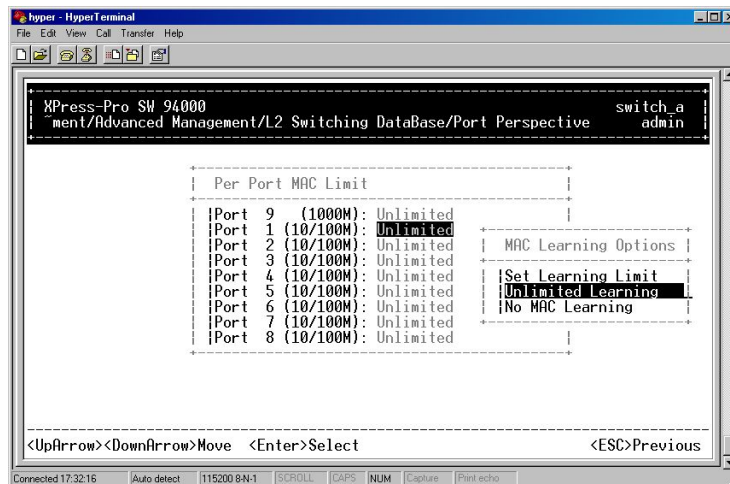
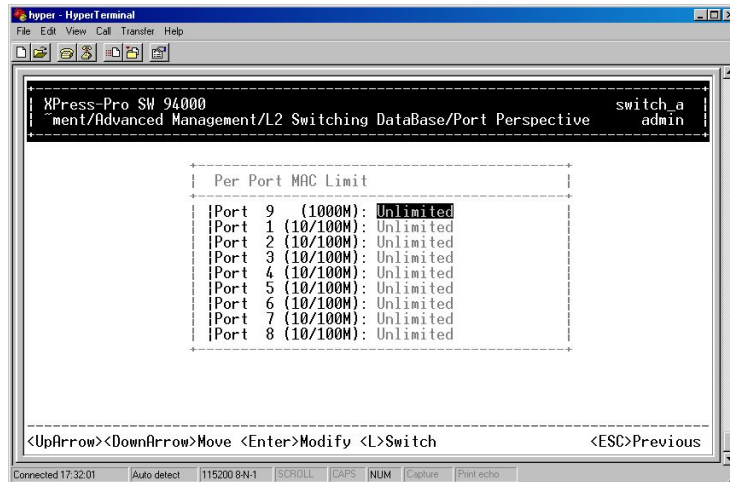
4. View or search by MAC address individually.
5. Press <Esc> to return to a previous screen as shown in step 1.
6. Move to highlight **Per Port Statistics** and press <Enter>.



7. Move to highlight a port and press <Enter>. (E.g. select Port 1 to view corresponding VLAN Activities.) Press [R] to reset counter for this port.

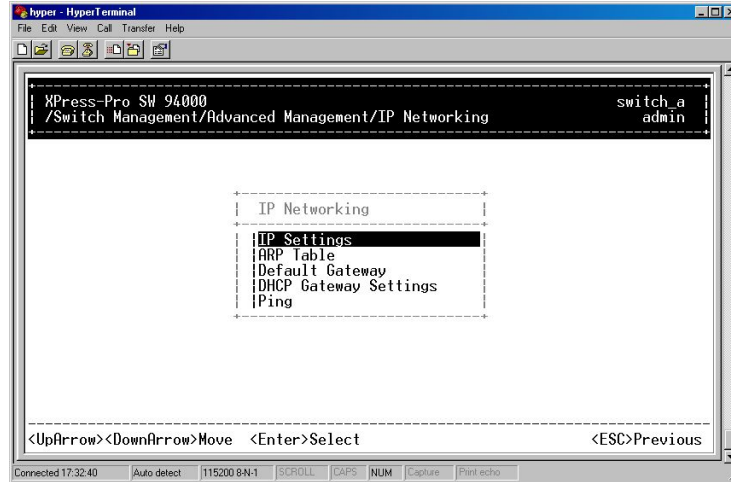


8. Move to highlight **Per Port MAC Limit** and press <Enter>.
9. Move to highlight a port and press <Enter>.

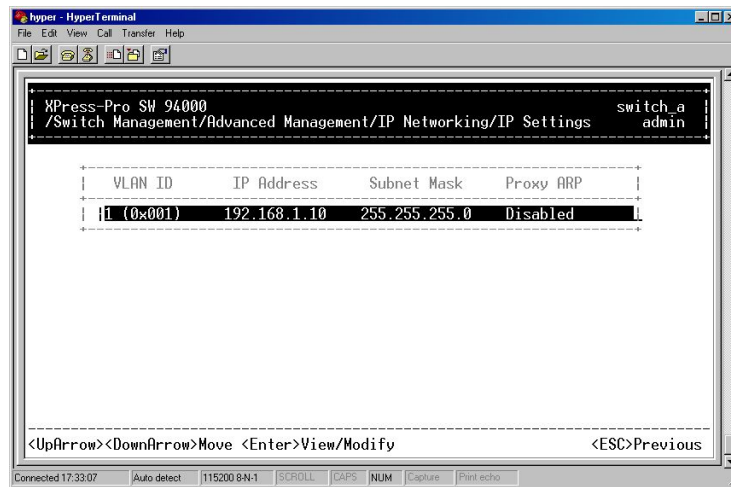


**IP Networking**

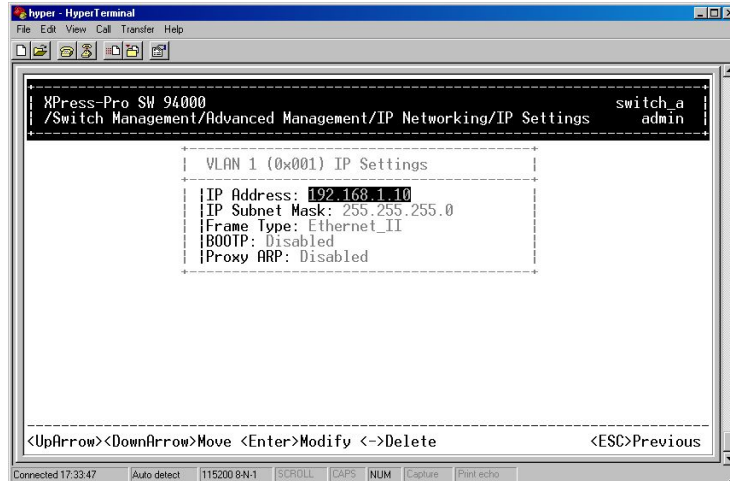
1. Move to highlight **IP Networking** from **Advanced Management** screen and press <Enter>.
2. Highlight **IP Settings** from **IP Networking** and press <Enter>.



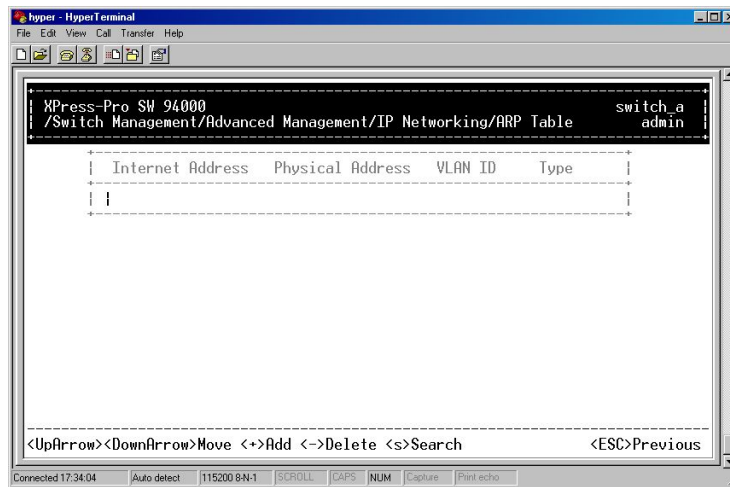
The screen shows a list of VLAN IDs, IP addresses, subnet masks, proxy ARPs currently defined.



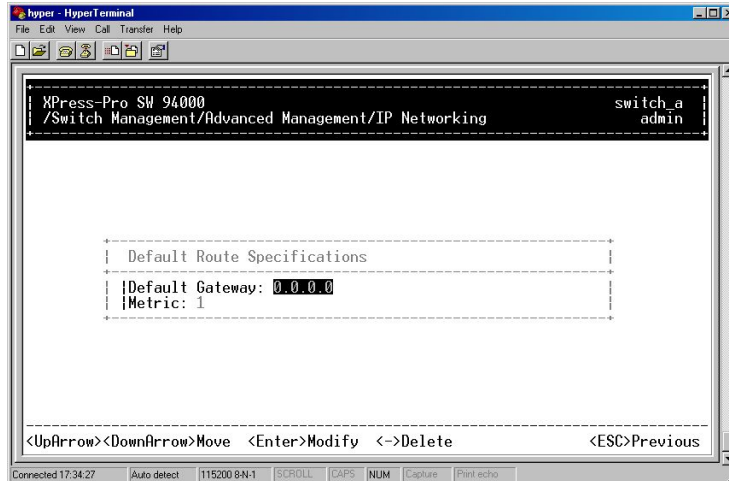
3. Move to highlight the row that contains the parameters you want to change, and then press <Enter>.



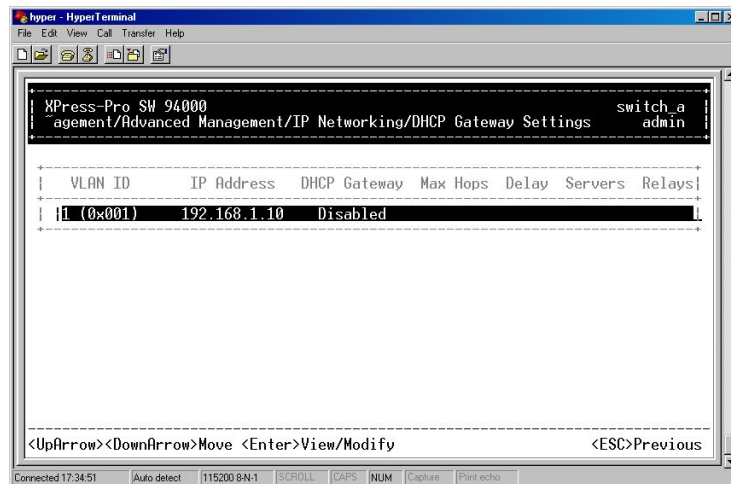
4. Highlight **ARP Table** from **IP Networking** and press **<Enter>**.
5. Press **<Shift>** and **[+]** on keypad to enter **Internet Address** and **Physical Address** in the **Static ARP Specifications**.



6. Highlight **Default Gateway** from **IP Networking** and press **<Enter>**.
7. Enter **Default Gateway** and **Metric** in the **Default Route Specifications**.

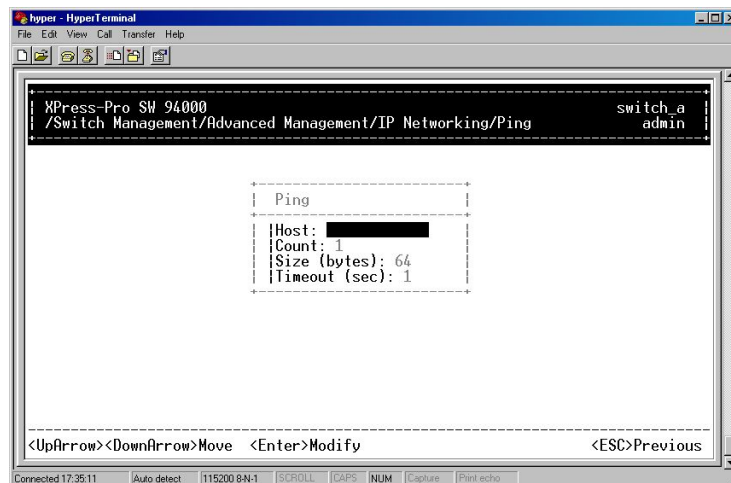


8. Highlight **DHCP Gateway Settings** from **IP Networking** and press <Enter>.



Ping Settings

1. Move to highlight **Ping** from **IP Networking** and press <Enter>.



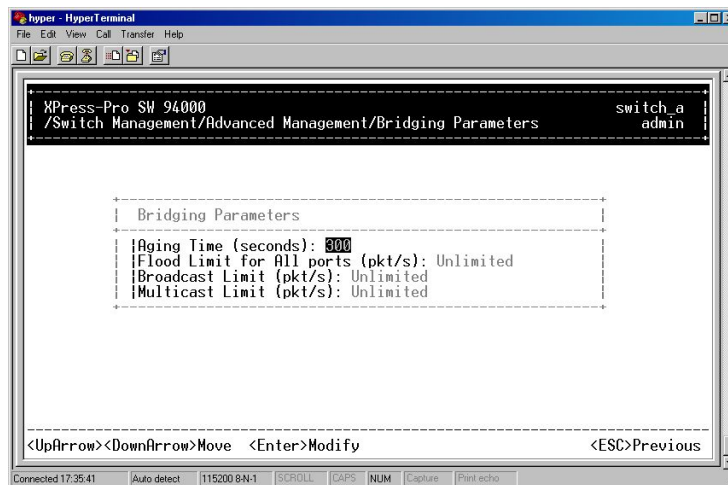
2. Move to highlight **Host** and press <Enter>.



3. Enter 4 decimal bytes (dot separated) as the IP address to ping.
4. Move to highlight **Count** and press <Enter>.
5. Specify a packet count number from 1 to 999, or type 0 for an infinite packet count. Press <Enter>.
6. Move to highlight **Size** and press <Enter>.
7. Specify a packet size from 0-1500. Press <Enter>.
8. Move to highlight **Timeout** and press <Enter>.
9. Specify a timeout value from 1-999. Press <Enter>.
10. Press <Esc> to start to ping when completed with the ping parameters.

### Bridging

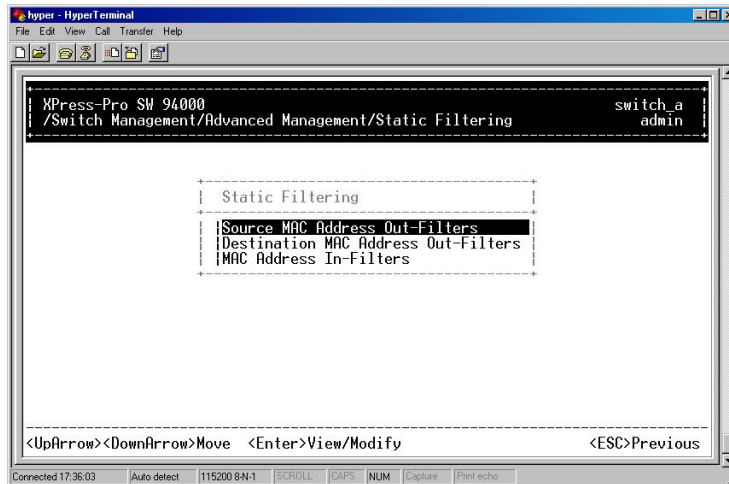
1. Move to highlight **Bridging** from **Advanced Management** screen, and press <Enter>.



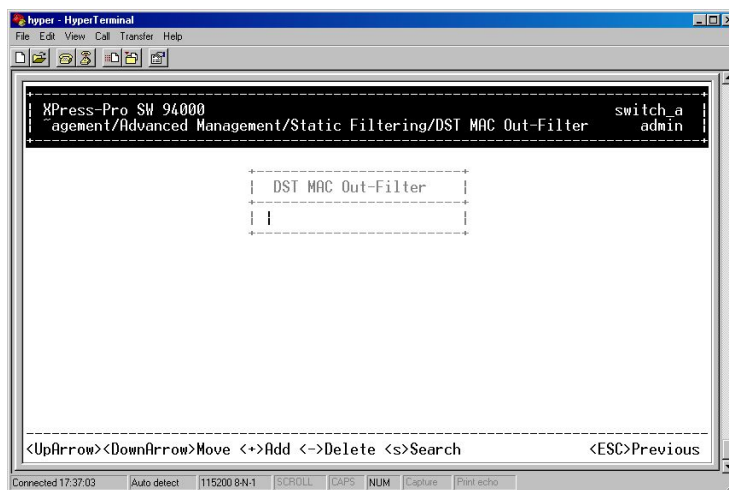
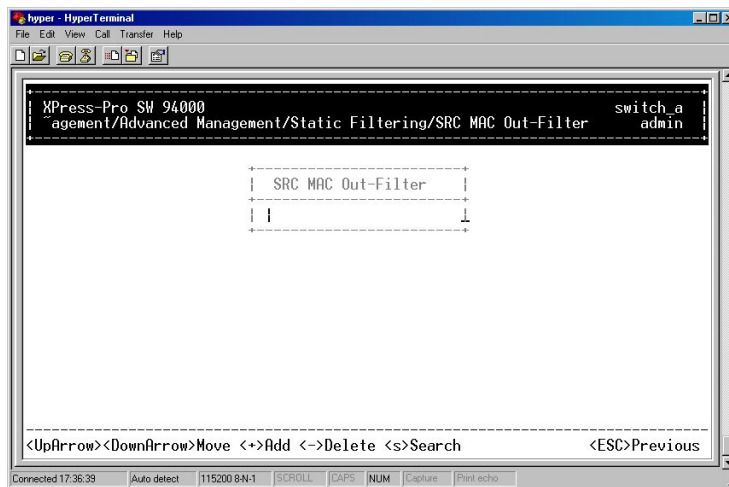
16. Move to highlight **Aging Time** and press <Enter>. Enter a decimal number as bridge aging period in seconds. Or, enter 0 for no aging.
17. Move to highlight **Flood Limit for All ports** and press <Enter>. Choose **Unlimited** or enter a decimal number as flood limit in packets per second. Or, enter 0 for no limit.
18. Move to highlight **Broadcast Limit** and press <Enter>. Choose **Unlimited** or enter a decimal number as broadcast limit in packets per second. Or, enter 0 for no limit.
19. Move to highlight **Multicast Limit** and press <Enter>.
20. Choose **Unlimited** or enter a decimal number as multicast limit in packets per second. Or, enter 0 for no limit.

### Static Filtering

1. Move to highlight **Static Filtering** from **Advanced Management** screen, and press <Enter>.



2. Move to highlight **Source** or **Destination** MAC addresses **Out-Filters** for static filtering, and press <Enter>.



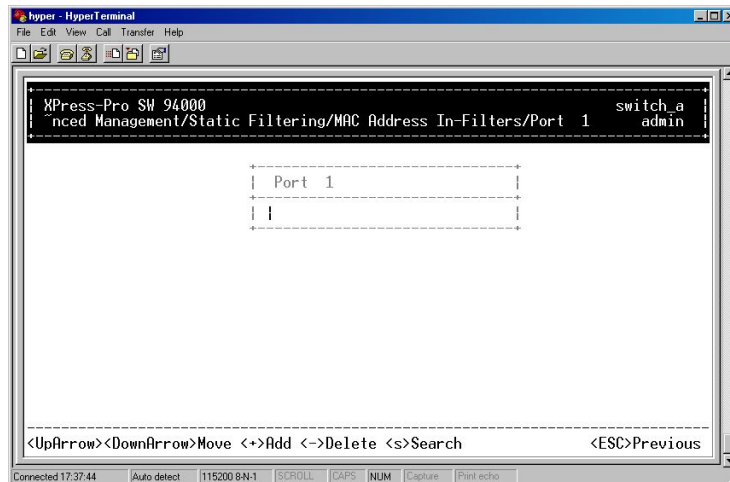
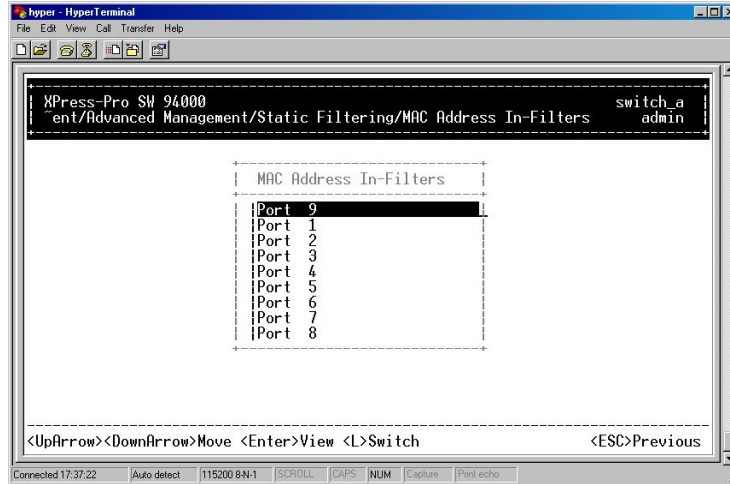
3. Press [+]  
on keypad to add a specific MAC address to be filtered.  
Press [-]  
to delete a specific MAC address from being filtered.

Press [S] to search through current list of MAC addresses in the static filtering database. The static filtering database maximum capacity is 64.

**Note:** \* No precautionary message appears before you delete a specific MAC address from being filtered. \* Be sure you want to delete it before doing so.

MAC Address In-Filters

1. Move to highlight **MAC Address In-Filters** from **Static Filtering** screen, and press <Enter>.

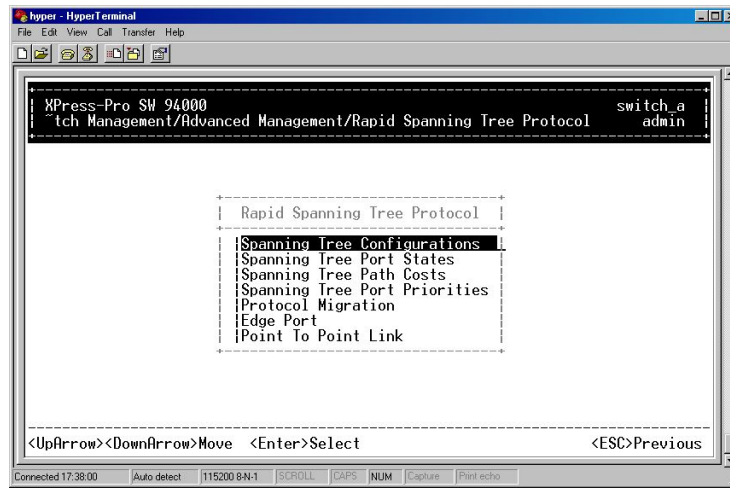


2. Move to highlight a port and press <Enter>.
3. Press <Shift> and [+ ] on keypad to add a specific MAC address to be filtered. Press [- ] to delete a specific MAC address from being filtered. Press <S> to search through current list of MAC addresses in the static filtering database.

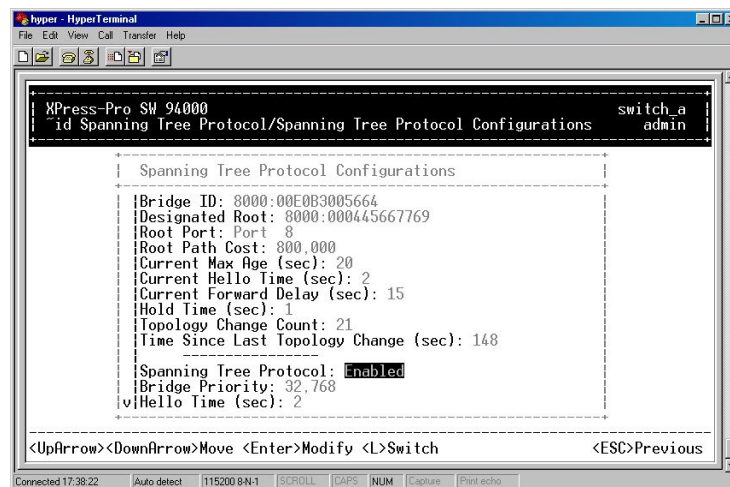
**Note:** \* No precautionary message appears before you delete a specific MAC address from being filtered. \* Be sure you want to delete it before doing so.

### Rapid Spanning Tree Protocol

1. Move to highlight **Rapid Spanning Tree** from **Advanced Management** screen, and press <Enter>.

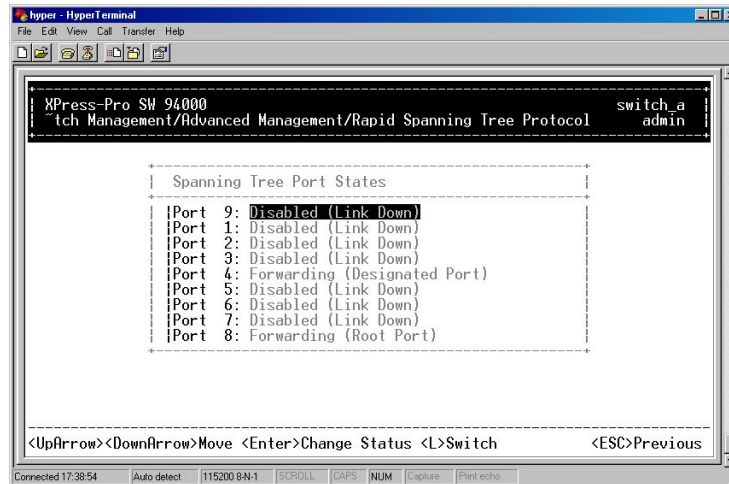


2. Move to highlight **Spanning Tree Configurations** if you want to change Spanning Tree Protocol Configurations.



3. Press <Enter> to enter **Spanning Tree Options**. Decide to have it Disabled or Enabled.
4. Move to highlight **Bridge Priority** and press <Enter>.Type a decimal number for the bridge priority and press <Enter>.
5. Move to highlight **Hello Time** and press <Enter>.Type a decimal number for the hello time and press <Enter>.
6. Move to highlight **Max Age** and press <Enter>.Type a decimal number for the max age.
7. Move to highlight **Forward Delay** and press <Enter>. Type a decimal number for the forward delay.
8. Move to highlight **STP Version** and press <Enter>.Choose **STP Compatible** or **RSTP** and press <Enter>.

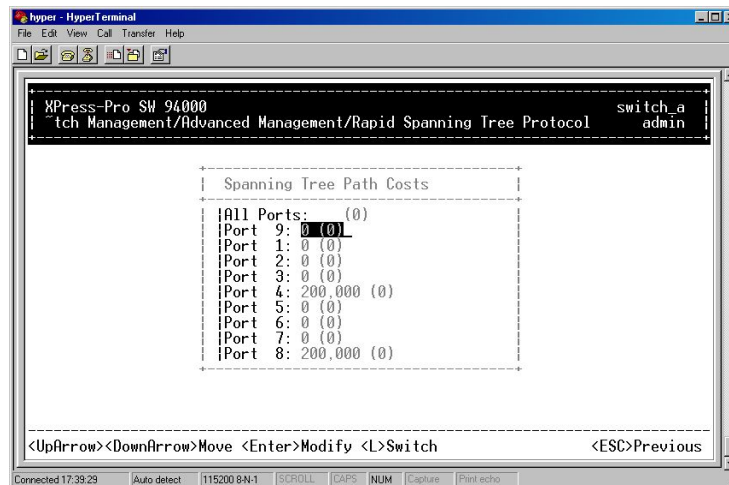
9. Move to highlight **Tx Hold Count** and press <Enter>. Type a decimal number for the Tx Hold Count.
10. Move to highlight **Path Cost Default** and press <Enter>. Choose **16-bit** or **32-bit** and press <Enter>.
11. Move to highlight **Spanning Tree Port States** if you want to change per port administration status, and press <Enter>.



12. Move to highlight a port if you want to **Enable** or **Disable** its administration status, and press <Enter>.

#### Spanning Tree Path Costs

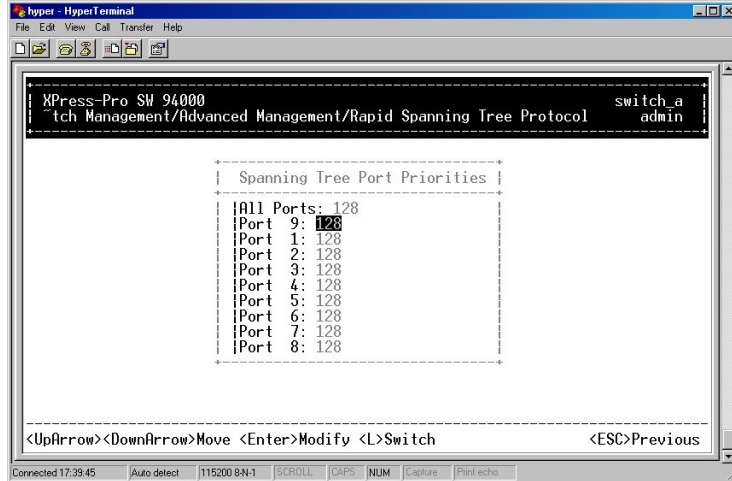
1. Move to highlight **Spanning Tree Path Costs** if you want to change the path cost, and press <Enter>.



2. Move to highlight **All Ports** or each port individually, and press <Enter>. For new path cost, type a decimal number and press <Enter>.

#### Spanning Tree Port Priorities

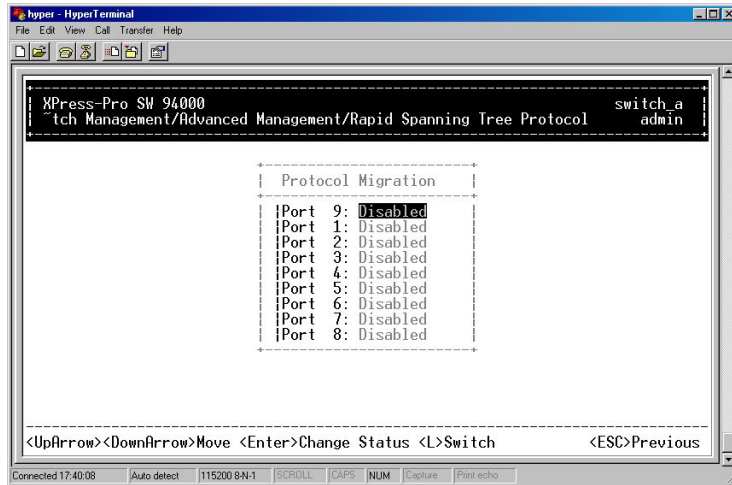
1. Move to highlight **Spanning Tree Port Priorities** if you want to change the priority level per port, and press <Enter>.



2. Move to highlight **All Ports** or each port individually, and press <Enter>. For new priority value, type a decimal number from 0-240, and press <Enter>. A low value gives the port a greater likelihood of becoming a Root port.

#### Protocol Migration

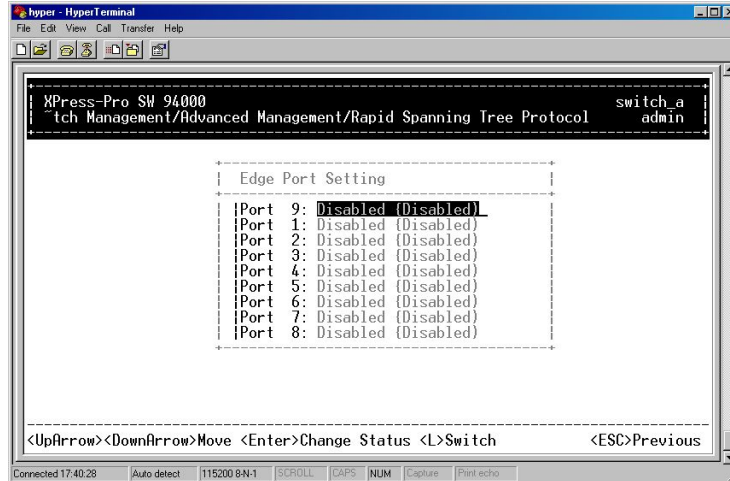
1. Move to highlight **Protocol Migration** if you want to change the Protocol Migration per port, and press <Enter>.



2. Move to highlight each port individually, and press <Enter> to **Enable** or **Disable** Protocol Migration.

#### Edge Port

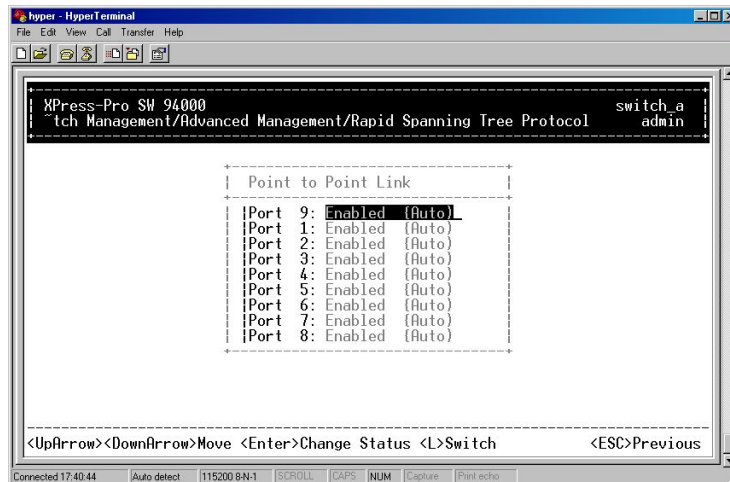
1. Move to highlight **Edge Port** if you want to change the Edge Port Setting per port, and press <Enter>.



2. Move to highlight each port individually, and press <Enter> to **Enable** or **Disable** Edge Port Setting.

#### Point To Point Link

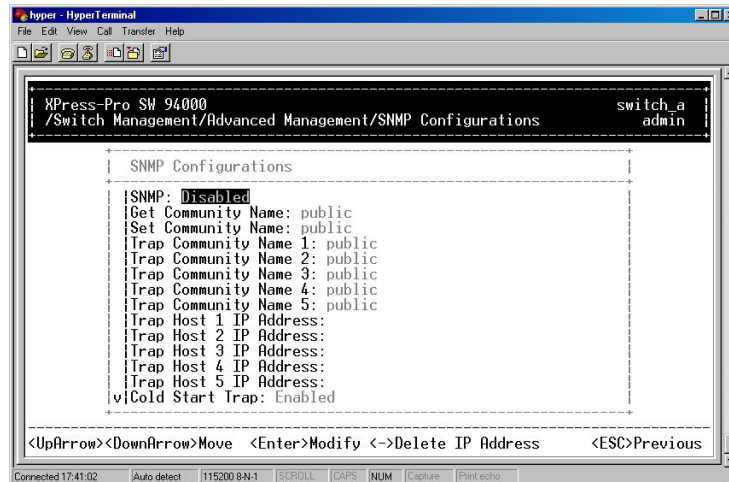
1. Move to highlight **Point To Point Link** if you want to change the Point To Point Link Options per port, and press <Enter>.



2. Move to highlight each port individually, and press <Enter> to choose **Enable**, **Disable**, or **Auto** Point To Point Link.

#### SNMP Functions

1. Move to highlight **SNMP** from **Advanced Management** screen, and press <Enter>.

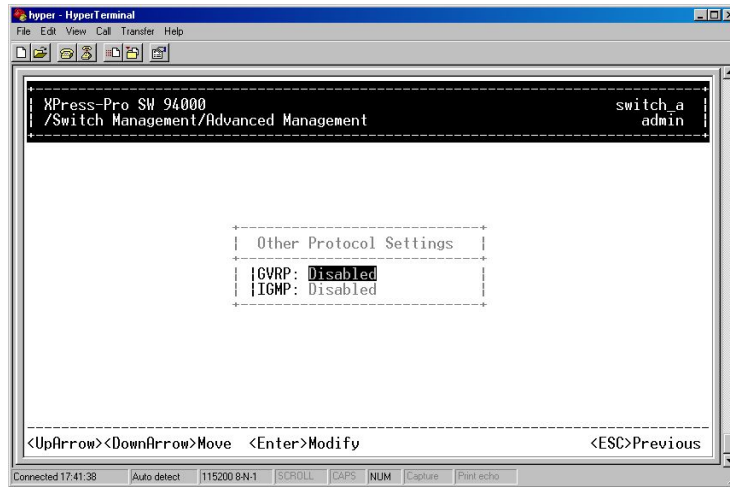


2. Move to highlight **SNMP** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
3. Move to highlight **Get Community Name** and press <Enter>. Enter text and press <Enter>.
4. Move to highlight **Set Community Name** and press <Enter>. Enter text and press <Enter>.
5. Move to highlight **Trap Community Name 1** and press <Enter>. Enter text and press <Enter>. Repeat to specify up to four more trap community names.
6. Move to highlight **Trap Host 1 IP Address** and press <Enter>. Type an IP address for trap host 1 and press <Enter>. Repeat to specify up to four more trap host IP addresses
7. Move to highlight **Cold Start Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
8. Move to highlight **Warm Start Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
9. Move to highlight **Link Down Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
10. Move to highlight **Link Up Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
11. Move to highlight **Authentication Failure Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
12. Move to highlight **Rising Alarm Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
13. Move to highlight **Falling Alarm Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.
14. Move to highlight **Topology Change Trap** and press <Enter>. Decide to have it **Disabled** or **Enabled**.

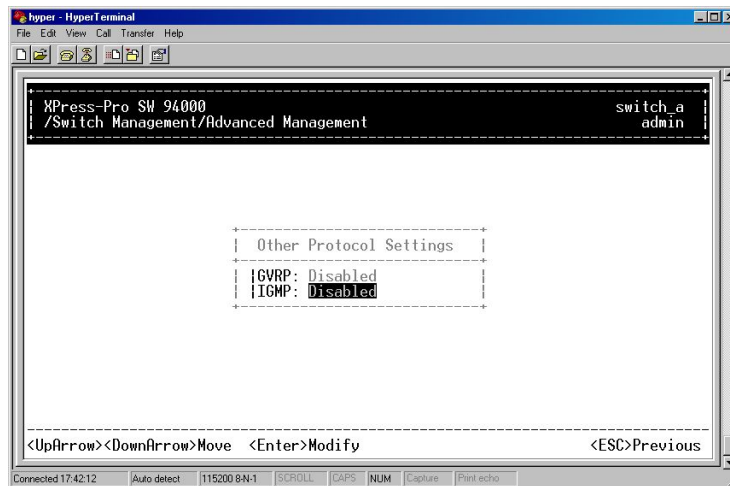


Other Protocols

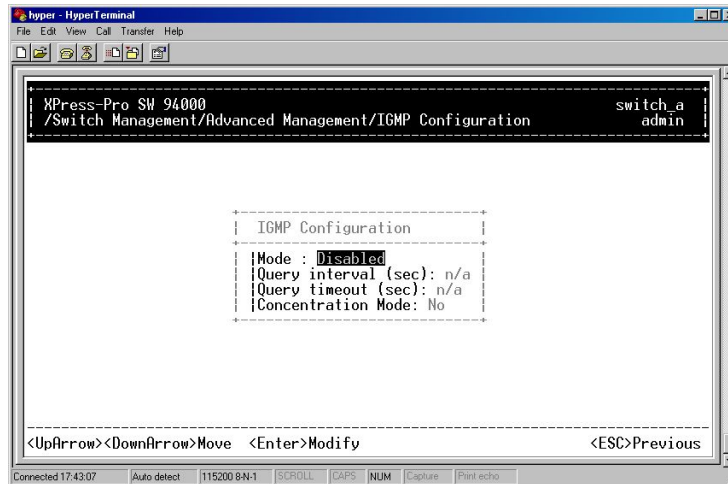
1. Move to highlight **Other Protocols** from **Advanced Management** screen, and press <Enter>.



2. Move to highlight **GVRP** and press <Enter>. Decide to have it **Disabled** or **Enabled**.



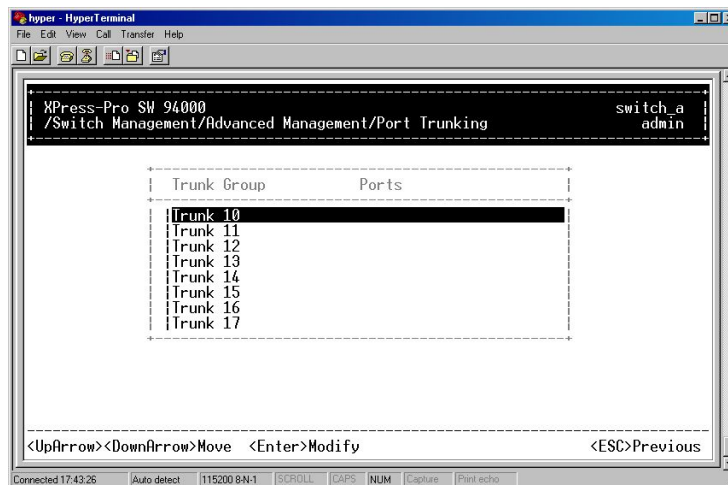
3. Move to highlight Mode and press <Enter>. Decide to have it **Disabled** or set in either **Passive** or **Active** mode.



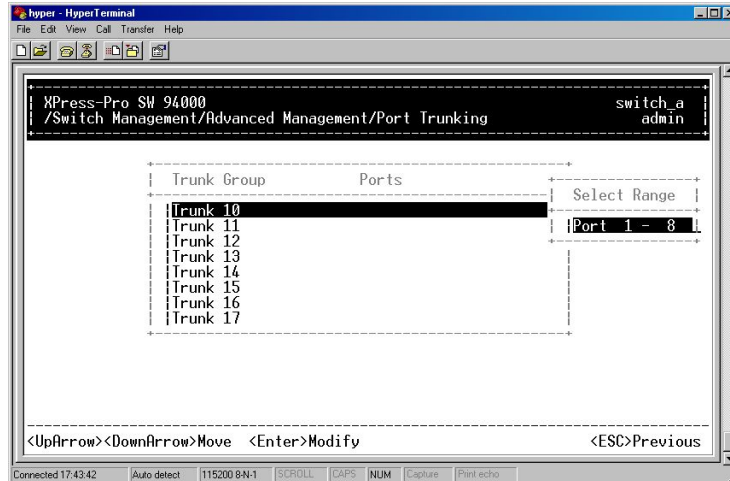
4. Move to highlight **Concentration Mode** and press <Enter>. Decide to have it **Disabled** or **Enabled**.

### Port Trunking

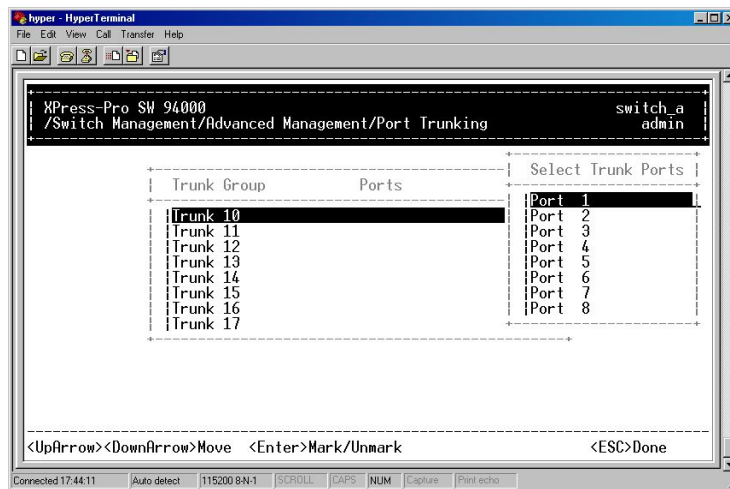
1. Move to highlight **Port Trunking** from **Advanced Management** screen, and press <Enter>.



2. Move to highlight a trunk group to which you want to assign ports, and press <Enter> to enter **Select Range**.



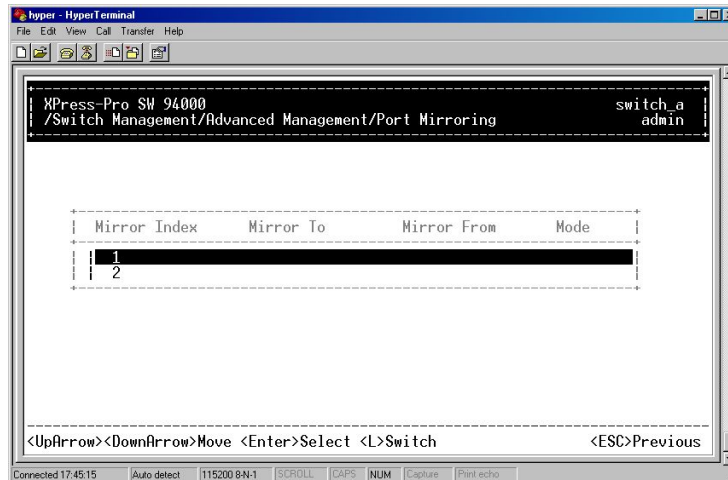
3. Press <Enter> to select each trunk port.



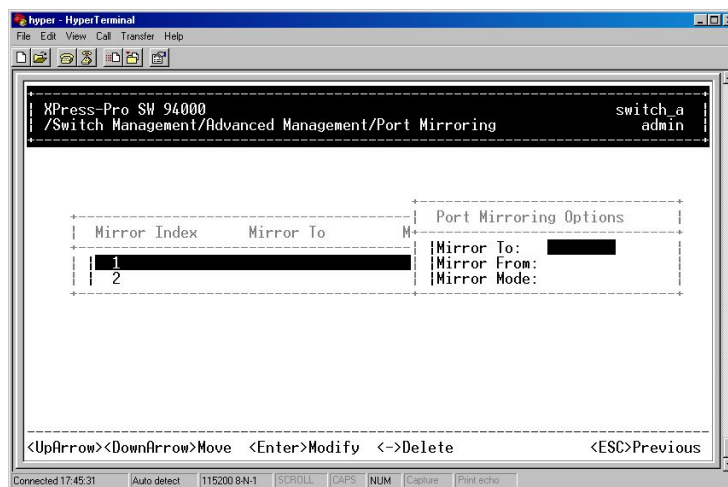
4. Press <Esc> when completed with selecting ports.

### Port Mirroring

1. Move to highlight Port Mirroring from Advanced Management screen, and press <Enter>.



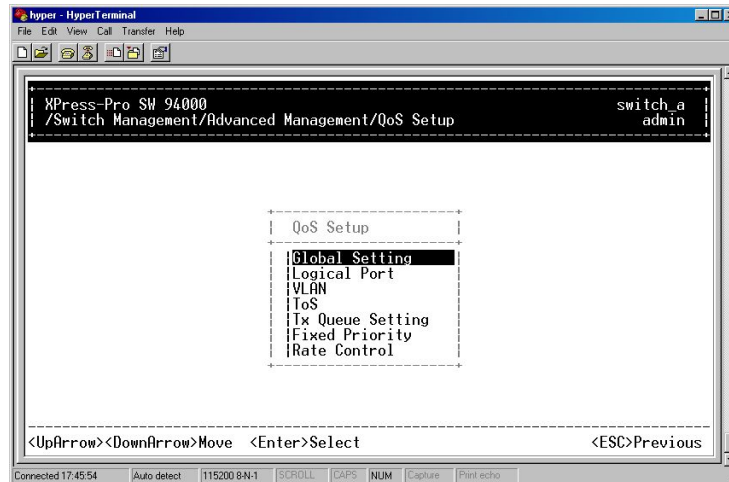
2. Press <Enter> to enter **Port Mirroring Options**.



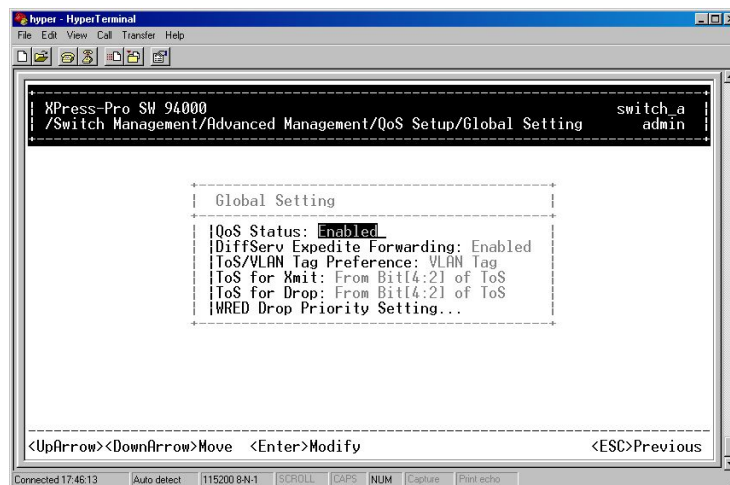
3. Press <Enter> to enter **Mirror To Options**, listing the ports that can be mirrored to.
4. Move to highlight the port you want to mirror to and press <Enter>.
5. Press <Enter> to enter **Mirror From Options**, listing the ports that can be mirrored from.
6. Move to highlight the port you want to mirror from and press <Enter>.
7. Move to select **Mirror Mode**. From **Mode Options**, decide whether the port to be mirrored from will be receiving or transmitting.
8. Press <Esc> when completed.

### QoS Setup

1. Move to highlight **QoS Setup** from **Advanced Management** screen, and press <Enter>.



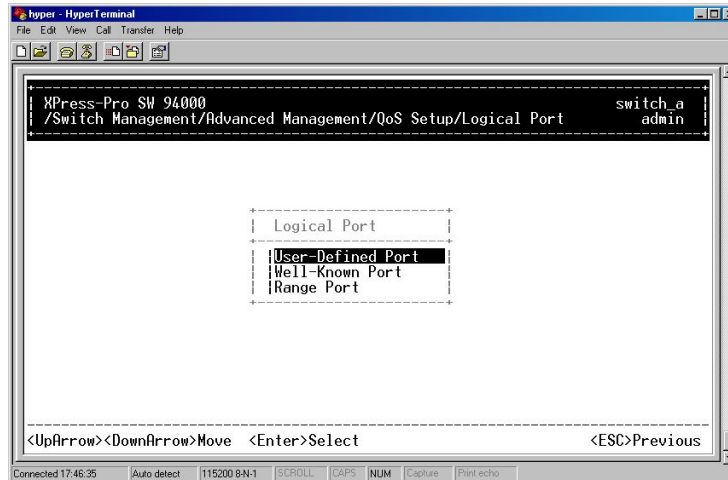
2. Move to highlight **Global Setting** and press <Enter>.
3. Move to highlight **QoS Status** and press <Enter>. Move to highlight to enable or disable **QoS Status** and press <Enter>.
4. Move to highlight **Diffserv Expedite Forwarding** and press <Enter>. Move to highlight to enable or disable **Diffserv Expedite Forwarding** and press <Enter>.
5. Move to highlight **ToS/VLAN Tag Preference** and press <Enter>. Highlight the **VLAN Tag** or **ToS** then press <Enter>.
6. Move to highlight **ToS for Xmit** and press <Enter>. Highlight the desired setting then press <Enter>.
7. Move to highlight **ToS for Drop** and press <Enter>. Highlight the desired setting then press <Enter>.
8. Move to highlight **WRED Drop Priority Setting** and press <Enter>. Move to highlight to **Low Drop Percentage** or **High Drop Percentage** and press <Enter>.
9. Press <Esc> when completed.



#### Logical Port

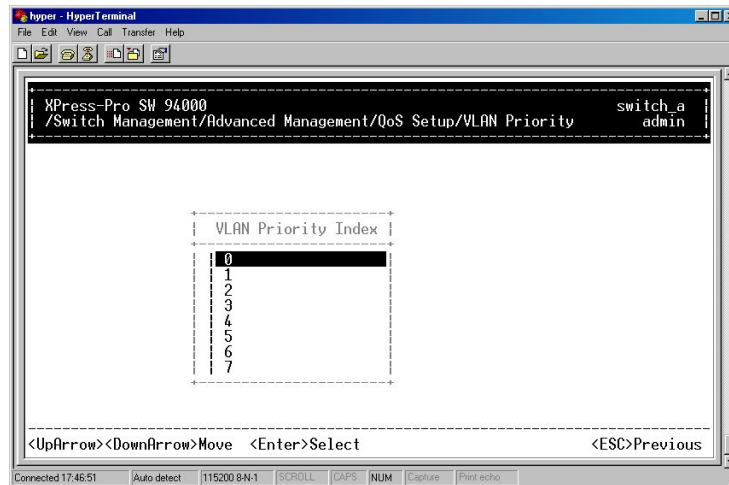
1. Move to highlight **Logical Port** and press <Enter>.

2. Move to highlight **User Define Port, Well-Known Port, or Range Port** and press <Enter>.
3. Move to highlight the appropriate port and press <Enter>.
4. Press <Esc> when completed.



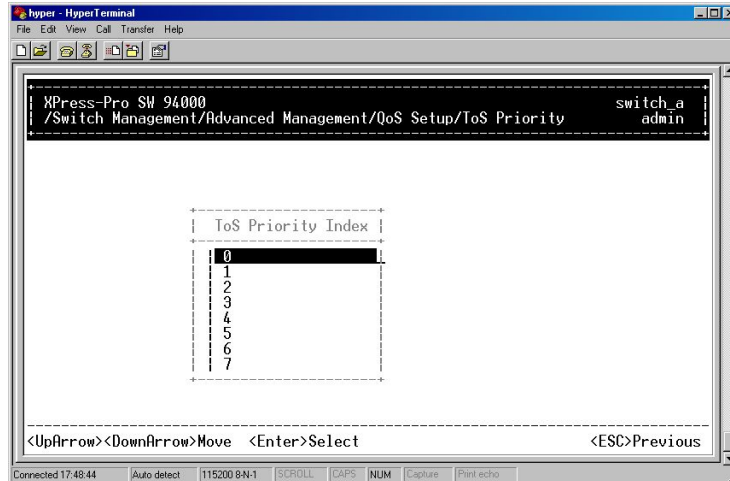
#### VLAN

1. Move to highlight **VLAN** and press <Enter> to specify the QoS VLAN priority.
2. Move to highlight any **VLAN Priority Index** and press <Enter>. Move to highlight **Drop Priority** or **Transmit Priority** and press <Enter> in the **VLAN Priority Setting** screen.
3. Press <Esc> when completed.



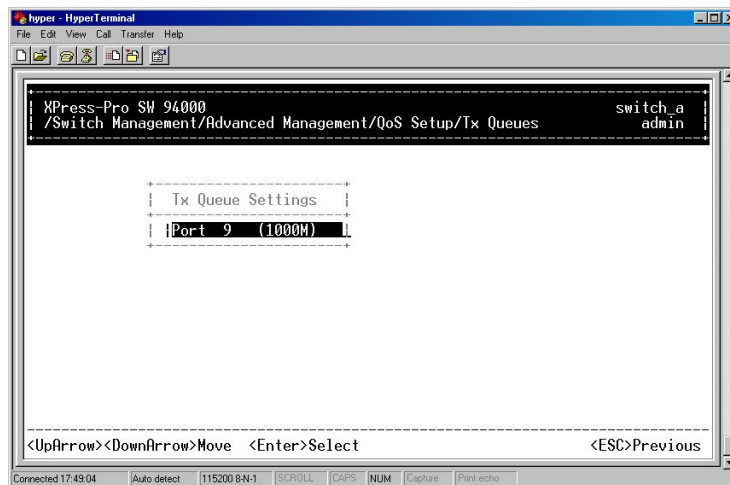
#### ToS

1. Move to highlight **TOS** and press <Enter> to specify the ToS priority.
2. Move to highlight any **ToS Priority Index** and press <Enter>. Move to highlight **Drop Priority** or **Transmit Priority** and press <Enter> in the **ToS Priority Setting** screen.
3. Press <Esc> when completed.



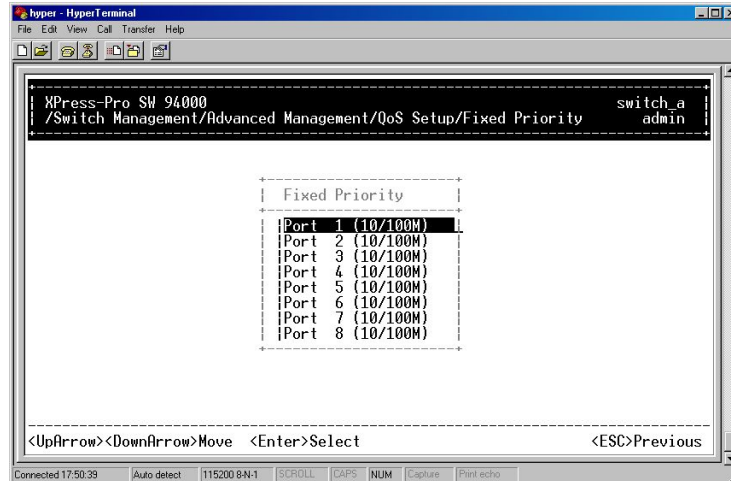
### Tx Queue Setting

1. Move to highlight **Tx Queue Setting** and press <Enter>.
2. Press <Esc> when completed.



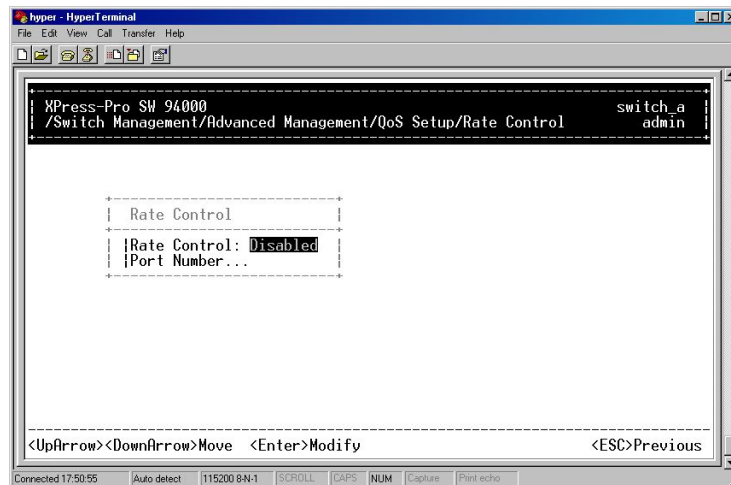
### Fixed Priority

1. Move to highlight **Fixed Priority** and press <Enter> to specify the Fixed Priority.
2. Move to highlight any port in the **ToS Priority** screen and press <Enter>. Move to **Fixed Drop Priority, Transmit Priority, or Priority**.
3. Press <Esc> when completed.



### Rate Control

1. Move to highlight **Rate Control** and press <Enter> to specify rate control parameters.
2. Move to highlight **Rate Control**, or **Port Number** and press <Enter>.
3. Press <Esc> when completed.



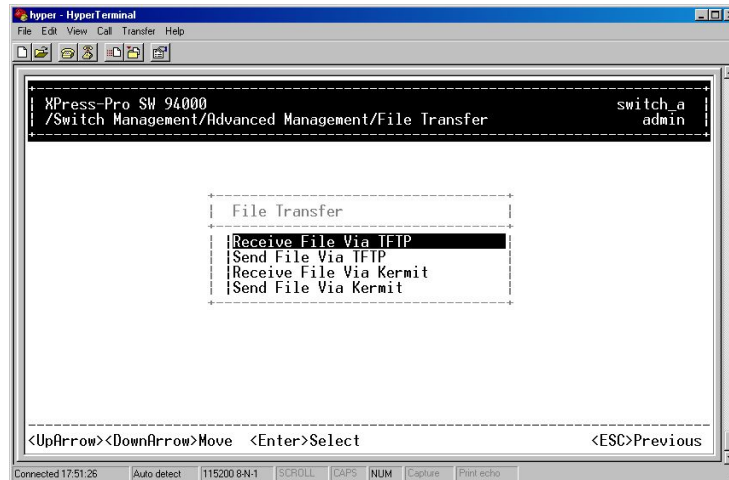
### File Transfer

The TFTP protocol is used to upload software to the switch and download software from the switch.

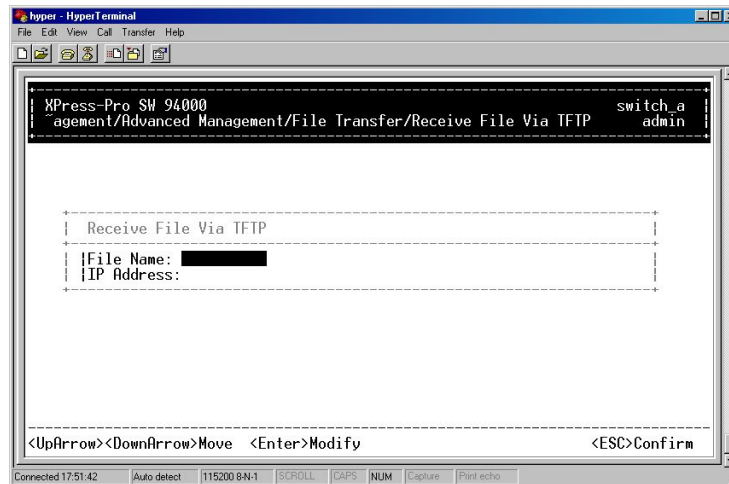
A VLAN with the proper IP address and routing path to the TFTP server must be configured for the switch to access the specified TFTP server.

1. Move to highlight **File Transfer** from **Advanced Management** screen, and press <Enter>.

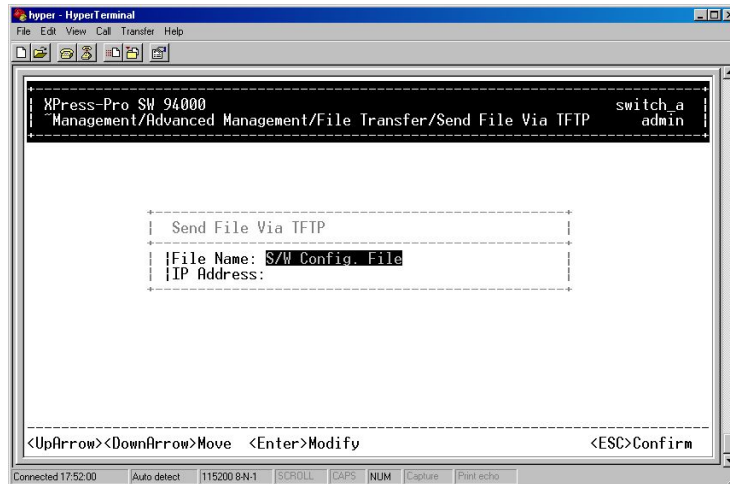




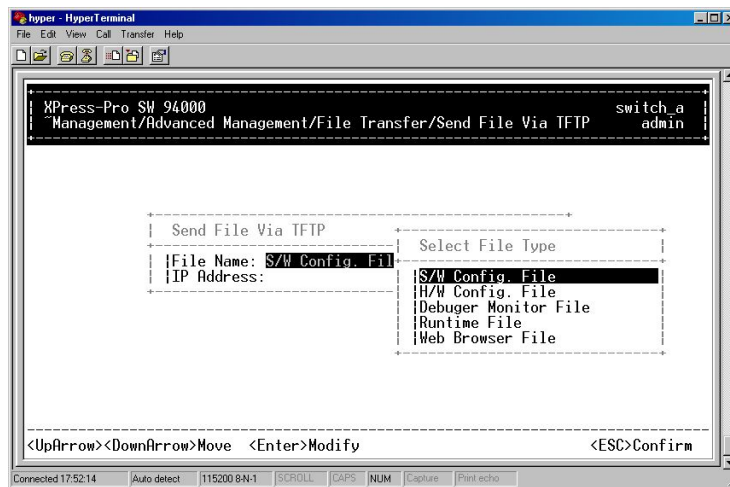
2. Move to highlight **Receive File Via TFTP** and press <Enter>.



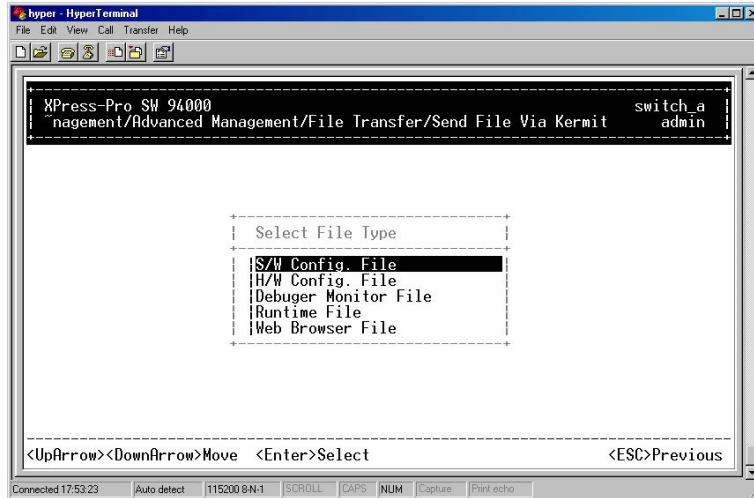
3. If the default **File Name** is not the one you intend to receive, press <Enter>. Type the name of the file you intend to receive and press <Enter>.
4. Move to highlight **IP Address** and press <Enter>. Type the IP address from where the file will be obtained.
5. Press <Esc> when completed. A dialog box appears to ask if you want to transfer file now.
6. Highlight [Yes] and press <Enter> to start file transfer. Or move to highlight [No] and press <Enter> to deny it. Or press <Esc> to exit.
7. Move to highlight **Send File Via TFTP** and press <Enter>.



8. If the default **File Type** is not the one you intend to send, press <Enter>. Select the file type you intend to send and press <Enter>.



9. Repeat steps 4-6.
10. In **File Transfer** screen obtained via console port, move to highlight **Receive File Via Kermit** and press <Enter>. A dialog box appears to ask if you want to transfer file now.
11. Move to highlight [Yes] and press <Enter> to start file transfer. Otherwise, highlight [No] and press <Enter> to deny it.
12. Press <Esc> to a previous screen.
13. In **File Transfer** screen obtained via console port, move to highlight **Send File Via Kermit** and press <Enter>.
14. Move to highlight a file type you intend to send and press <Enter>. A dialog box appears to ask if you want to transfer file now.
15. Move to highlight [Yes] and press <Enter> to start file transfer. Otherwise, highlight [No] and press <Enter> to deny it.



16. Press <Esc> to a previous screen.

### Logout

To log out, highlight [Logout] from [Switch Management] screen and press <Enter>. Please remember to save settings you have changed before you log out.

### Save Settings

To save the current settings and remain in the configuration program, highlight [Save Settings] from [Switch Management] and press <Enter>.

### Restore Default Settings

To restore the factory default settings, highlight [Restore Default Settings] from [Switch Management] and press <Enter>.

The Xpress-Pro SW 94000 switch will be rebooted after confirming Yes as to restore the default settings.

### Reboot

To reboot the Xpress-Pro SW 94000 switch, highlight [Reboot] from [Switch Management] and press <Enter>.

## 6: Web-Based Browser Management

The s Xpress-Pro SW 94000 witch provides a web-based browser interface for configuring and managing the Xpress-Pro SW 94000 switch. This interface allows you to access the Xpress-Pro SW 94000 switch using a preferred web browser.

This chapter describes how to configure the Xpress-Pro SW 94000 switch using its web-based browser interface.

### Logging on to the switch

#### Switch IP Address

In your web browser, specify the IP address of the Xpress-Pro SW 94000 switch.

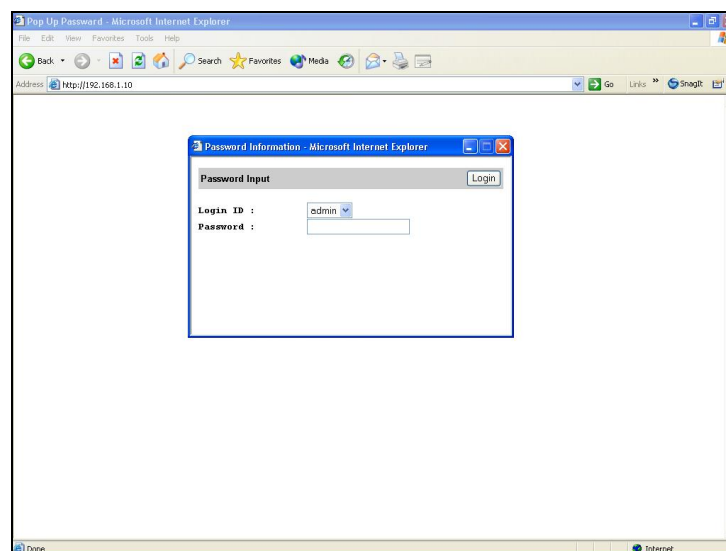
#### Login ID

Enter the factory default login ID: **admin**.

#### Password

Enter the factory default password (no password, **press Enter directly**).

Or enter a user-defined password if you followed the instructions later and changed the factory default password.

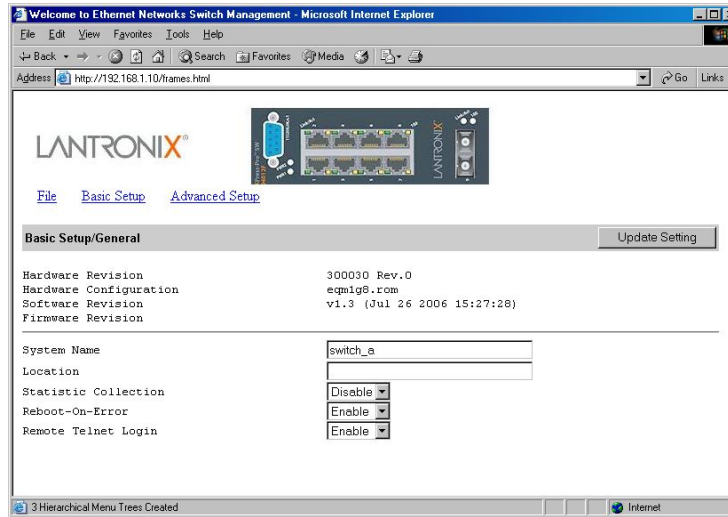


## Understanding the Browser Interface

The web browser interface provides three point-and-click buttons at the upper field of the screen for configuring and managing the Xpress-Pro SW 94000 switch.

In addition, you can click any port on the Xpress-Pro SW 94000 switch image to view the Xpress-Pro SW 94000 switch's current speed, duplex, and activity status.

The Basic Setup/General parameters appear at the lower field of the screen. These parameters can also be displayed by clicking Basic Setup button and select General in sub-menu.



### File

Save settings configured in the browser interface / upload software via TFTP / download software via TFTP / reboot the switch / logout of the browser interface.

### Basic Setup

Perform general, LAN port, and console port activities.

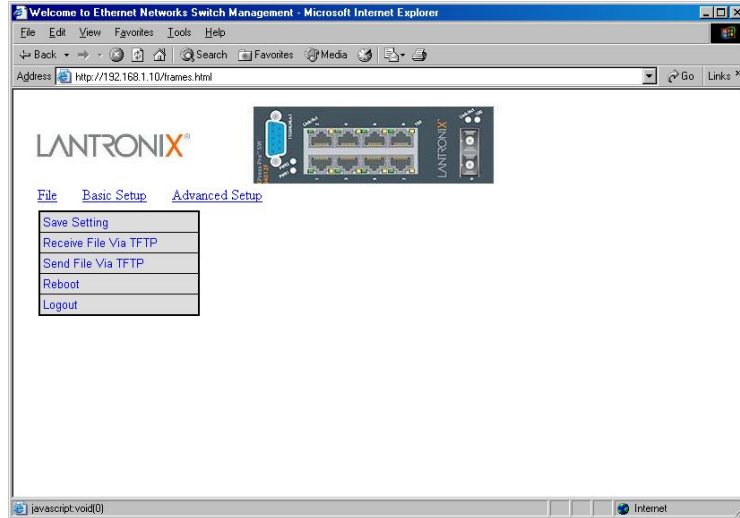
### Advanced Setup

Perform MAC Address Management / IP Networking / Port Perspective / Bridging / Static MAC Filters / IP Multicast Group / VLAN & PVID Perspective / RSTP / SNMP / Other Protocols / Port Trunking / QoS / Port Mirroring.

## Performing File Activities

### To perform File Activities:

1. Click the **File** button at the upper field of the main display, the menu options appear.

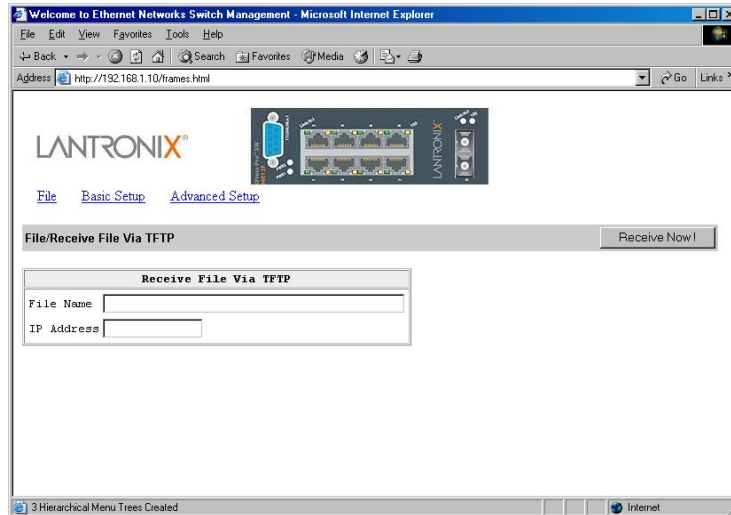


Saving Setting

1. Click **Saving Setting** to save your configuration settings.
2. When you click it, a message asks **Are you sure you want to save setting?**, click **OK** to save it or **Cancel** to abort it.

Receive File Via TFTP

1. Click Receive File Via TFTP on the File display.



**Notes:** The TFTP protocol is used to upload software to the Xpress-Pro SW 94000 switch.

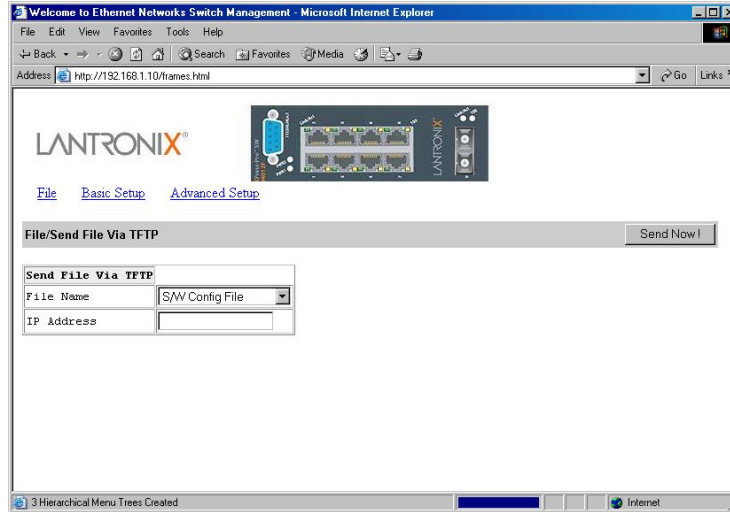
A VLAN with the proper IP address and routing path to the TFTP server must be configured for the Xpress-Pro SW 94000 switch to access the specified TFTP server.

2. For **File Name**, type the name of the file you intend to receive.
3. For **IP Address**, type the IP address from where the file will be obtained.

4. Click **Receive Now!**.

Send File Via TFTP

1. Click **Send File Via TFTP** on the **File** display.



1. For **File Name**, choose the file you intend to send.
2. For **IP Address**, type the IP address you intend to send to.
3. Click **Send Now!**.

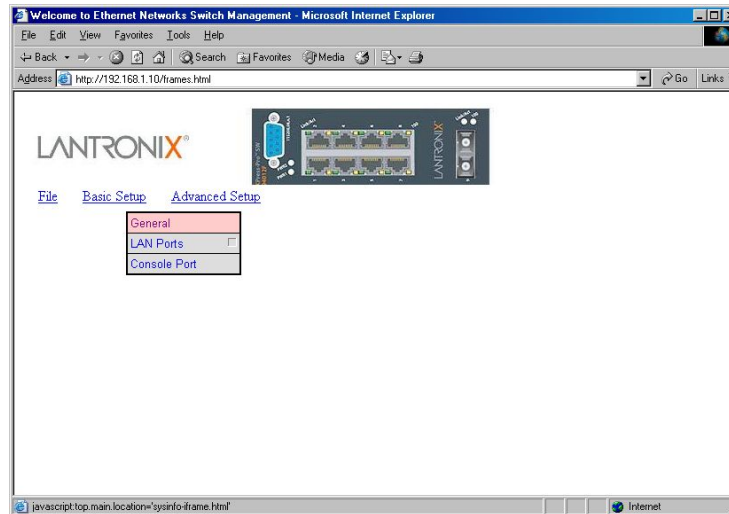
Reboot

1. Click **Reboot** on the **File** display.
2. When you click it, a message asks "Are you sure you want to save setting? ", click **OK** to save it or **Cancel** to abort it.
3. Click **Logout** on the **File** display.
4. When you click it, a message asks "Are you sure you want to save setting? ", click **OK** to save it or **Cancel** to abort it.

## Performing Basic Setup Activities

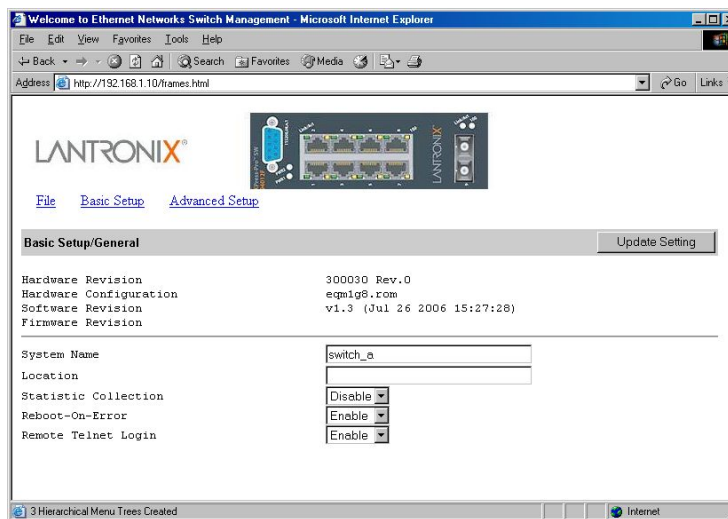
### To perform Basic Setup Activities:

1. Click the **Basic Setup** button at the upper field of the main display, the menu options appear.



### General Management Configuration

1. Click **General** and the screen shows the Basic Setup/General parameters. The screen here is the same when you first access the Xpress-Pro SW 94000 switch browser interface.



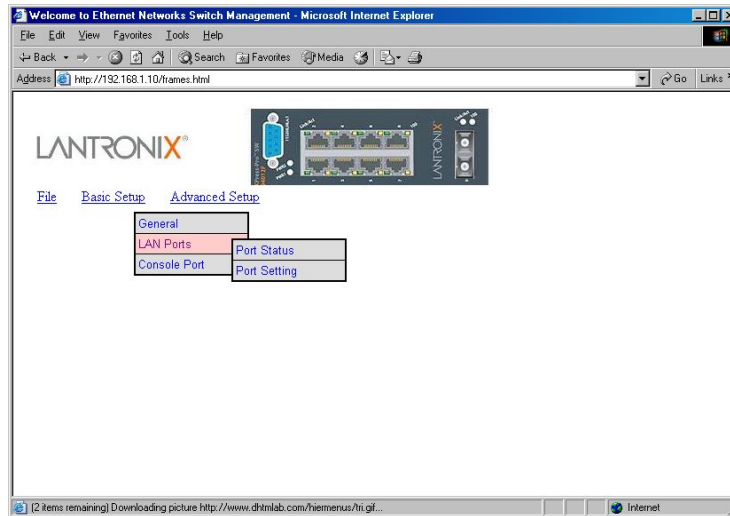
2. Click in **System Name** text box on the field of **Basic Setup/General**.
3. Type a system name if it is blank, or replace the current system name with a new one.
4. Click in **Location** text box on the field of **Basic Setup/General**.
5. Type a location name if it is blank, or replace the current location name with a new one.
6. To enable or disable statistics collection at the Xpress-Pro SW 94000 switch, click the appropriate option from **Statistic Collection** drop-down menu.



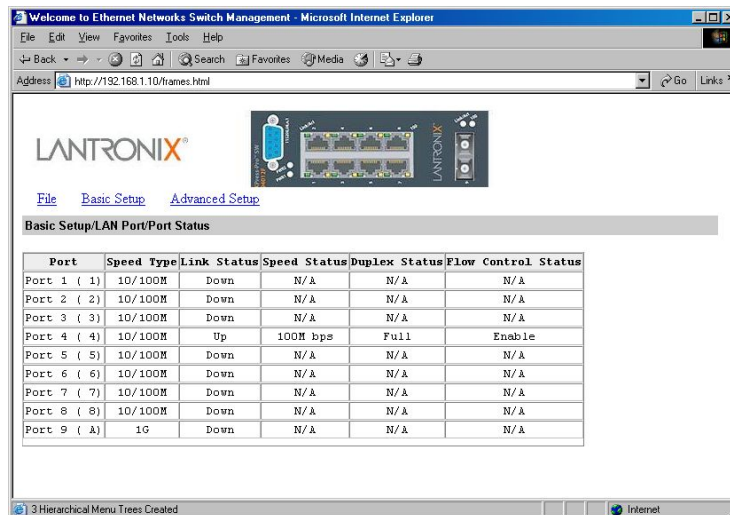
7. To allow or prevent the Xpress-Pro SW 94000 switch from rebooting when a fatal error is detected, click the appropriate option from **Reboot-On-Error** drop-down menu.
8. To enable or disable access to the Xpress-Pro SW 94000 switch management program via Telnet, click the appropriate option from **Remote Telnet Login** drop-down menu.
9. Click **Update Setting**. A confirmation window appears.

LAN Ports Configuration

1. To access the LAN configuration parameters, click **Basic Setup** button first and then point to **LAN Ports** and click a suitable option.

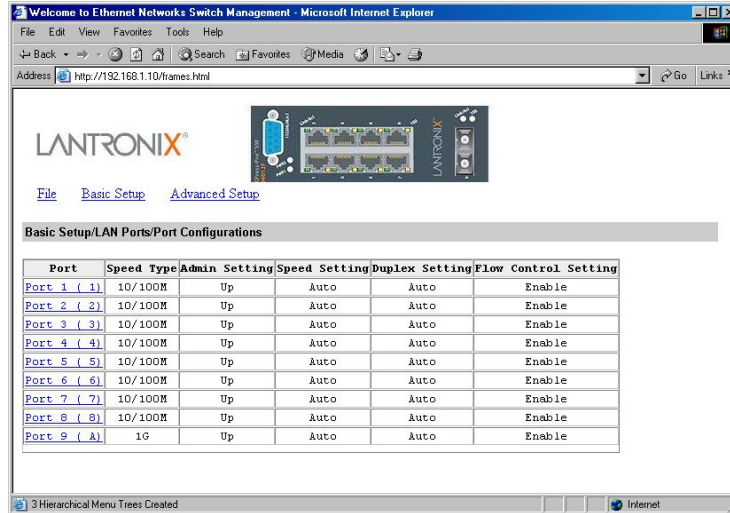


2. Click **Port Status** to view the Speed Type, Link Status, Speed Status, Duplex Status, and Flow Control Status for all ports.

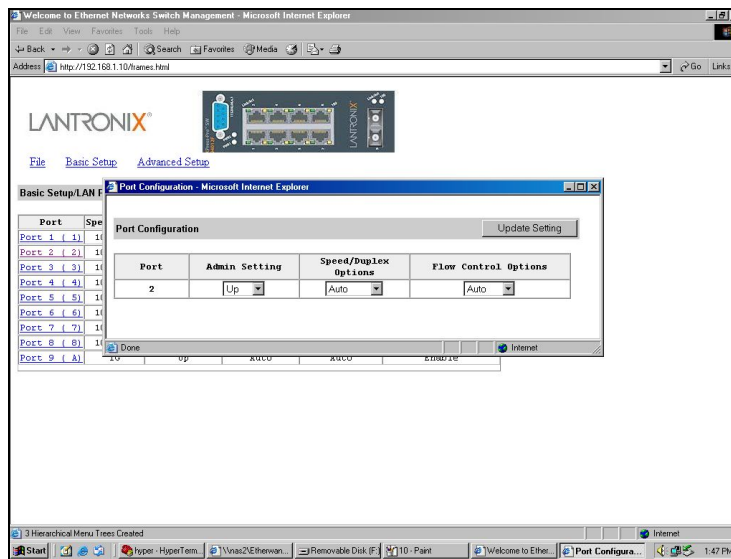


**Note:** The information displayed automatically updates every 15 seconds, without requiring you to refresh the window.

3. Click **Port Setting** to access the configuration information for all ports.



4. In the **Port** column, click the port you want to configure. E.g. click Port 1.



5. Click the drop-down menu under **Admin Setting**, decide to disable or enable it.

**Note:** Disable places the port in DOWN state. In this state, packets cannot be switched to and from the port. Enable places the port in UP state. In this state, packets can be switched to and from the port.

6. Click the drop-down menu under **Speed/Duplex Options** if you want to change the line speed and duplex settings.

**Note:** Auto allows the Xpress-Pro SW 94000 switch to automatically ascertain the line speed and duplex mode. All the other selections force the port to use a specific line speed and duplex mode. 'HD' denotes half-duplex mode; FD denotes full-duplex mode.

7. Click the drop-down menu under **Flow Control Options** if you want to configure the flow control for this port.

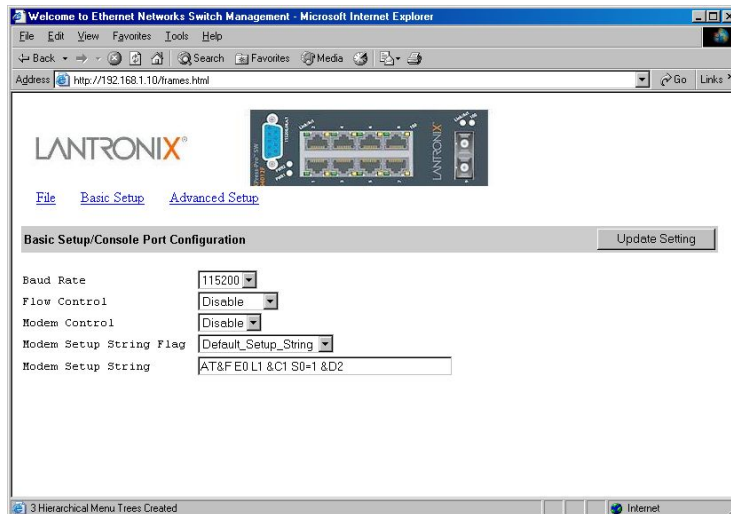
**Note:** Auto allows the Xpress-Pro SW 94000 switch to automatically ascertain whether or not to use flow control. Disable: turns off flow control at all times. Enable: turns on flow control at all times.

- Click **Update Setting** when completed. A confirmation window appears.

**Note:** For your convenience, click the LEDs on the image of the Xpress-Pro SW 94000 switch and view its current speed, duplex, and link activity.

#### Console Port Configuration

- To access the console port configuration parameters, click **Basic Setup** button first and then click **Console Port**.



- Click an appropriate speed from **Baud Rate** drop-down menu on the field of **Basic Setup/Console Port Configuration**.

**Note:** Auto allows the Xpress-Pro SW 94000 switch to autobaud between 9600bps and 115,200bps All the other selections force a specific console baud rate.

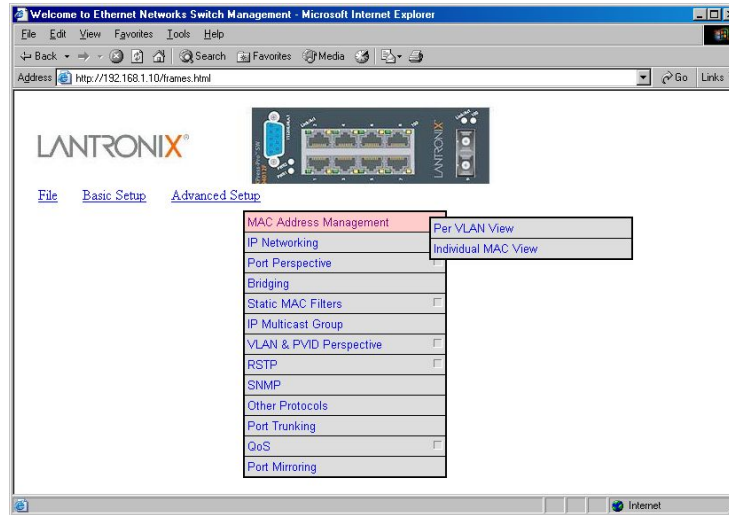
- Click a flow control method from **Flow Control** drop-down menu.
- Click an appropriate option from **Modem Control** drop-down menu to disable or enable a modem connection to the console port.
- If you enabled a modem connection to the console port, click in **Modem Setup String Flag** drop-down menu to decide whether you want to use a Default\_Setup\_String or Custom\_Setup\_String.
- If you select Custom\_Setup\_String, enter the string in the **Modem setup String** text box.

**Note:** The default modem setup string configures the modem to auto answer. It works for all Hayes-compatible modems.

## Performing Advanced Setup Activities

### To perform Advanced Setup Activities:

1. Click the **Advanced Setup** button at the upper field of the main display, the menu options appear.

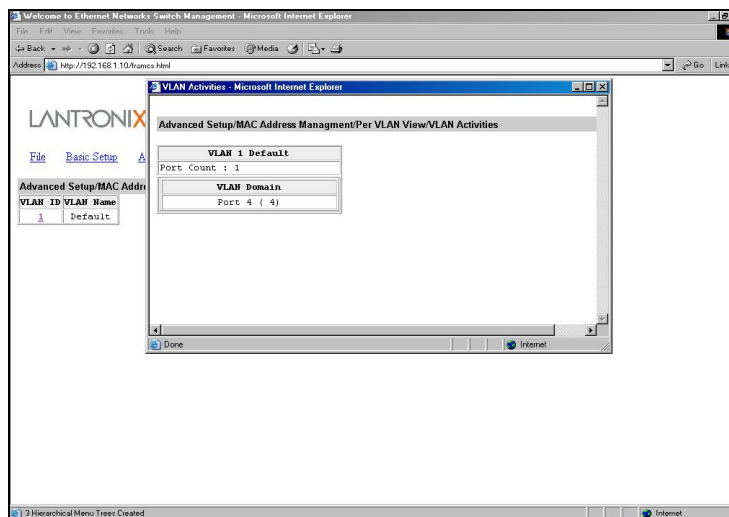


### MAC Address Management

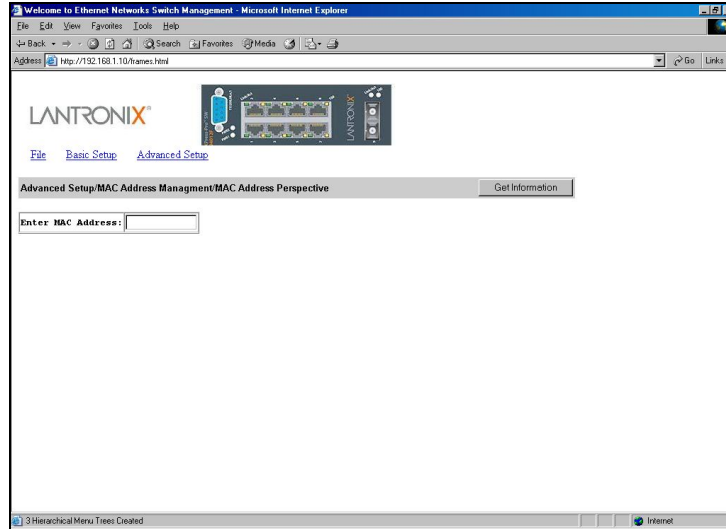
1. From the **Advanced Setup** menu, point to **MAC Address Management** to view VLANs and their associated MAC addresses.

### Per VLAN View

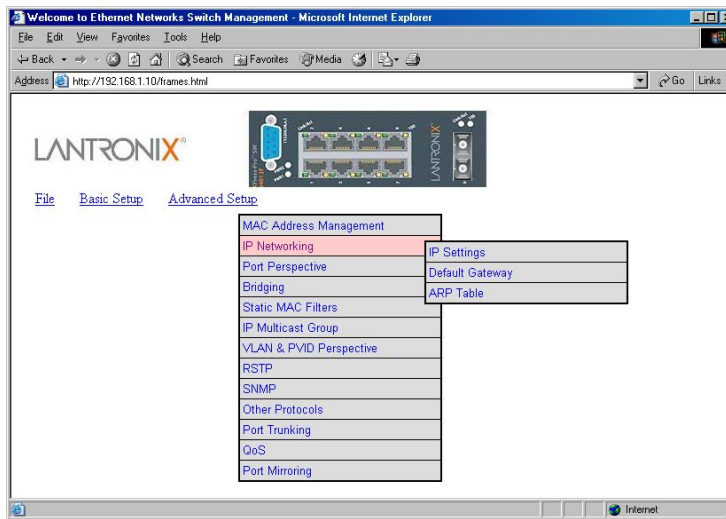
1. Click **Per VLAN View** first and click on the port that you want to view.
2. Close the **VLAN Activities** window when finished viewing.



3. From the Advanced Setup menu as shown in Step 1, point to MAC Address Management. Click Individual MAC View.
4. Click in the **Enter MAC Address** text box and type the MAC address that you want to view. Then click on the **Get Information** button.

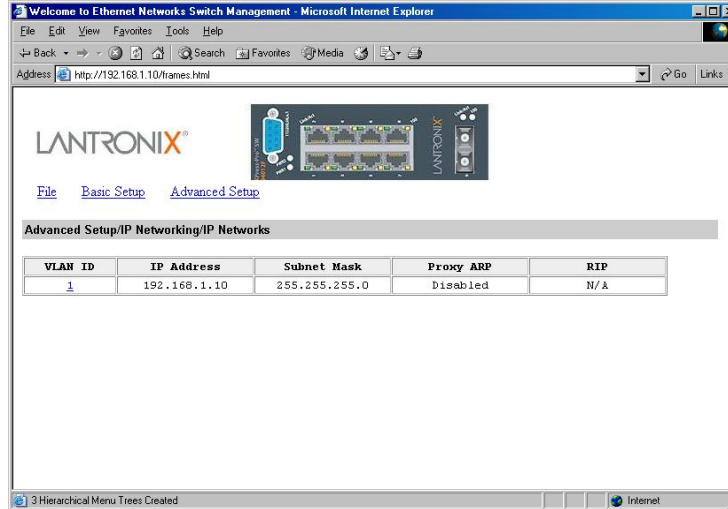


5. Close the **Individual MAC View** window when finished viewing.
6. To access the IP networking parameters, click the **Advanced Setup** button, and Point to **IP Networking** from the selection menu.

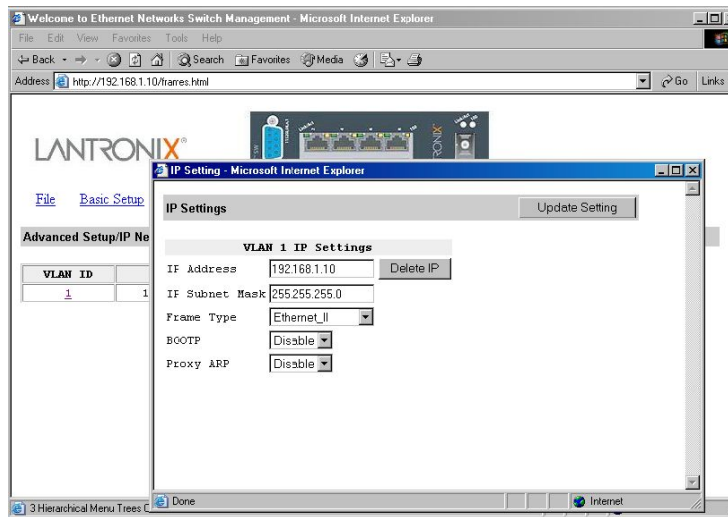


#### IP Settings

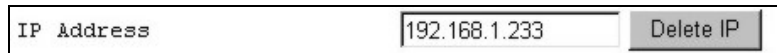
1. Click **IP Settings** to access IP settings. A list of VLAN IDs appears, along with their corresponding IP address and subnet mask.



2. In the **VLAN ID** column, click a VLAN ID whose settings you want to view and/or change.

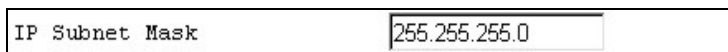


3. To change the IP Address, click in the text box and type a new address. Alternatively, you can use the Delete IP button to delete the IP address.

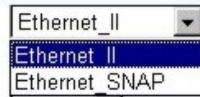


**Note:** No precautionary message appears before you delete the IP address.  
 \* Be sure you want to delete it before doing so.\* The IP address is not deleted until you click **Update Setting**.

4. To change the **IP Subnet Mask**, click in the text box and type a new address.



5. To change the **Frame Type**, click a value from the drop-down list.



- To change the **BOOTP** selection, click a value from the drop-down list.



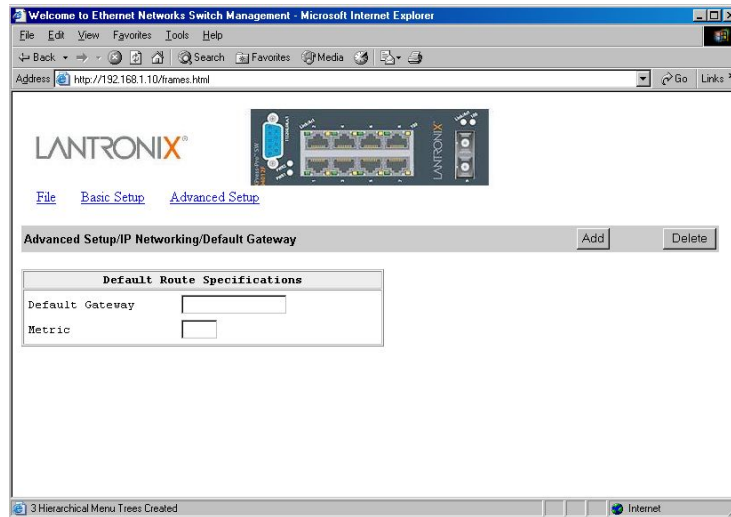
- To change the **Proxy ARP** selection, click a value from the drop-down list.



- When you finished with these selections, click Update Setting. A confirmation window appears. Click to close the confirmation window.

#### Default Gateway

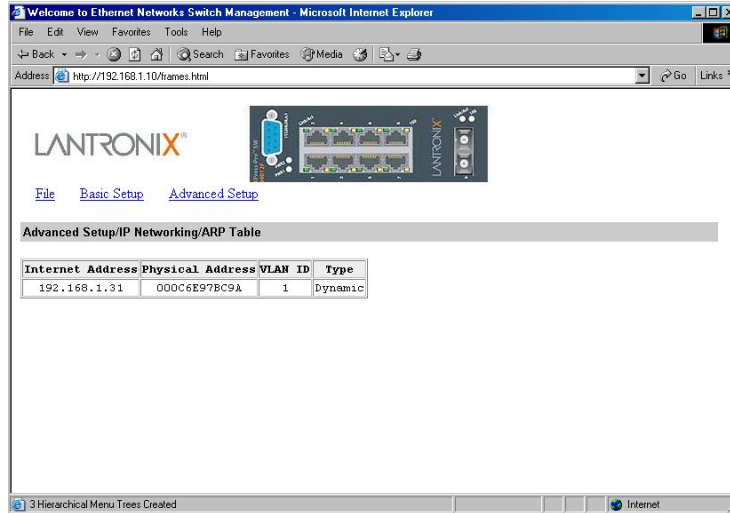
- Click **Default Gateway** to access Default Gateway settings.



- To set the **Default Gateway**, click in the text box and type a new Default Gateway.
- To set the **Metric**, click in the text box and type a new Metric.
- When you finished with these settings, click **Add** button. Alternatively, you can use the **Delete** button to delete the settings.

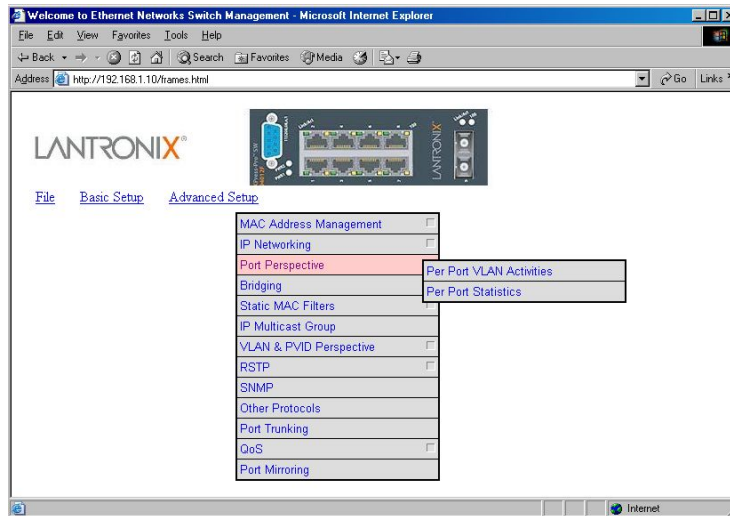
#### ARP Table

- Click **ARP Table** to view ARP Table.



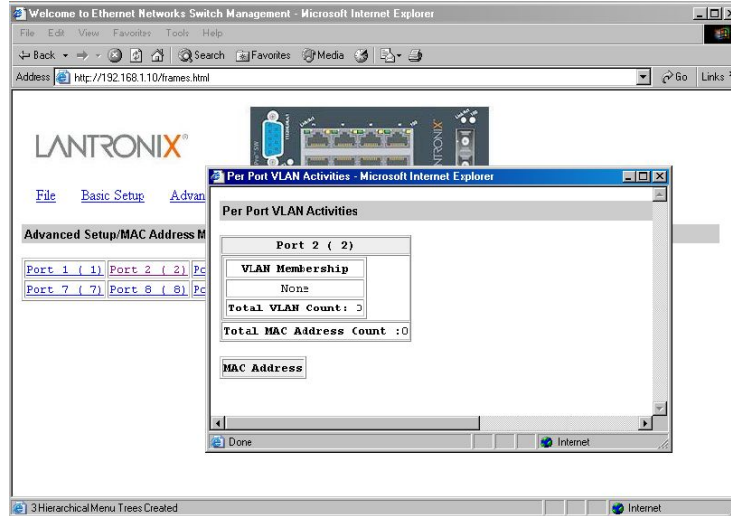
Port Perspective

1. To access Port Perspective, click the **Advanced Setup** button, and then click **Port Perspective** from the selection menu.

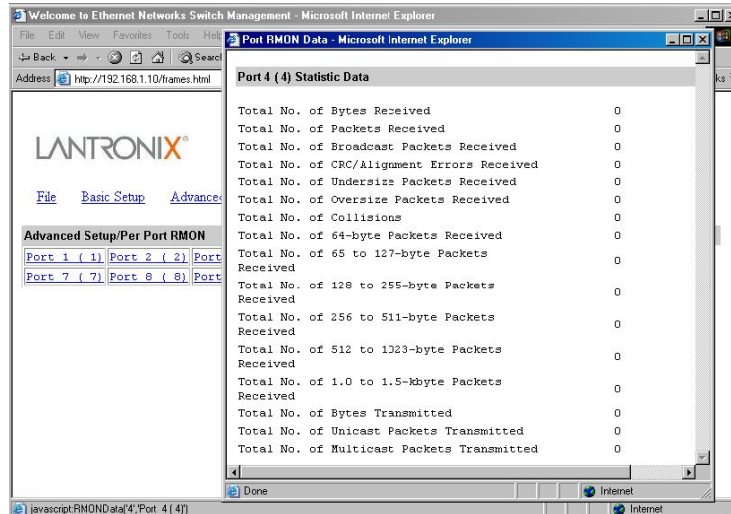


2. To access Port Perspective VLAN Activities, click the **Per Port VLAN Activities** from the selection menu. Click a port to view Port Perspective VLAN Activities.



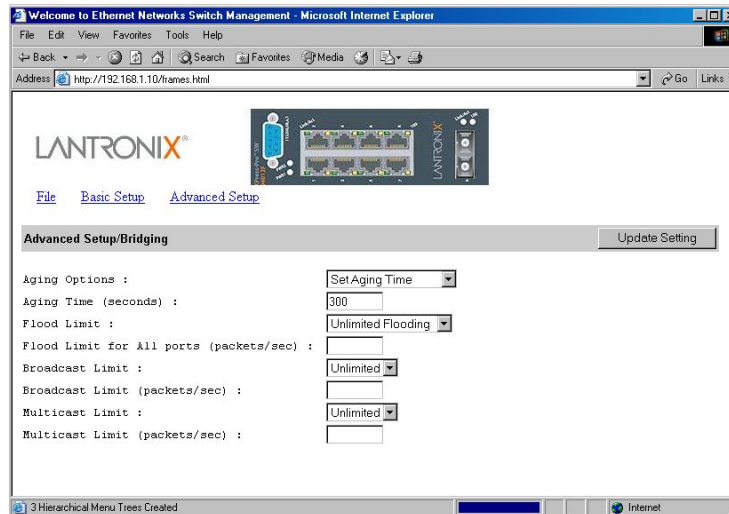


3. To access Per Port Statistics, click the **Per Port Statistics** from the selection menu. Click a port to view statistic data.



### Bridging

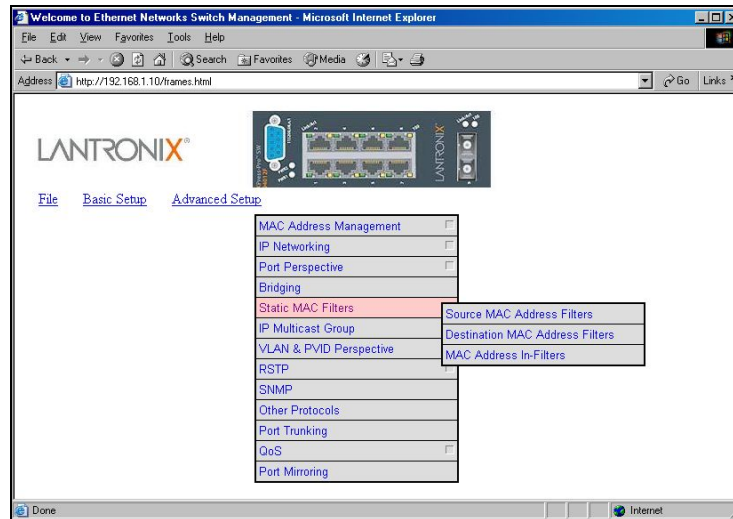
1. To access bridging parameters, click the **Advanced Setup** button, and then click **Bridging** from the selection menu.



2. Click the drop-down list for **Disabled (No Aging)** or **Set Aging Time**.
3. Click the text box and type a decimal number as bridge aging period in seconds.
4. Click the drop-down list for **No Flooding**, **Controlled Flooding**, **Unlimited Flooding**.
5. Click the text box and type a decimal number as flood limit in packets per second.
6. Click the drop-down list for **Set Limit** or **Unlimited**.
7. Click the text box and type a decimal number as broadcast limit in packets per second.
8. Click the drop-down list for **Set Limit** or **Unlimited**.
9. Click the text box and type a decimal number as multicast limit in packets per second.

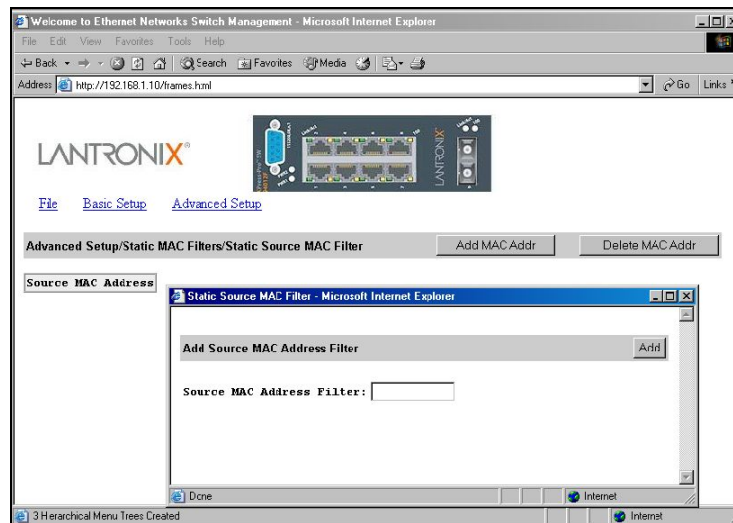
#### Static MAC Filters

1. To access the Static MAC Filters parameters, click the **Advanced Setup** button, and point to **Static MAC Filters** in the selection menu.

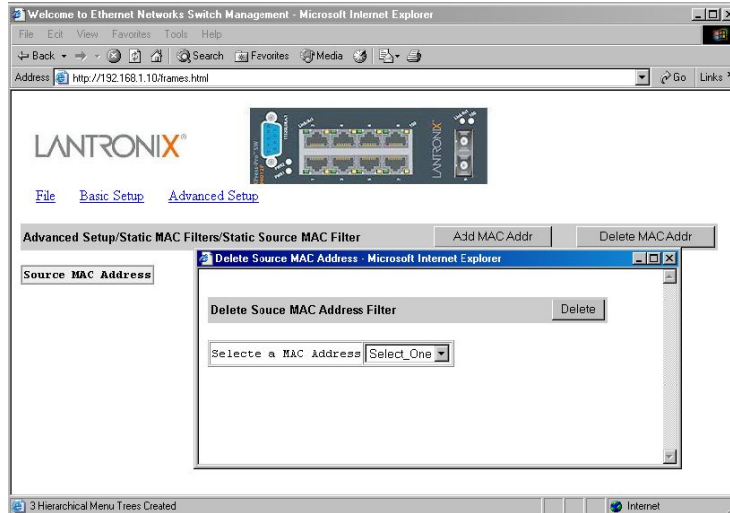


Source MAC Address Filters

1. Click Source MAC Address Filters.
2. Click Add MAC Addr button to add a source MAC address for static filtering.



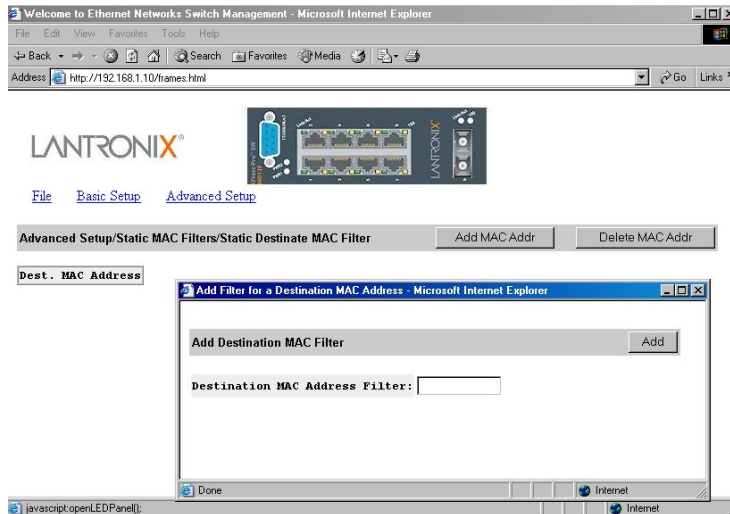
3. The **Static Source MAC Filter** window appears. Click in the **Source MAC Address Filter** text box and type a unique MAC source address you want to add. Then click the **Add** button.
4. A confirmation window appears. Close the confirmation window.
5. If you no longer need a source MAC address, click **Delete MAC Addr** button to delete it in **Step 2**.



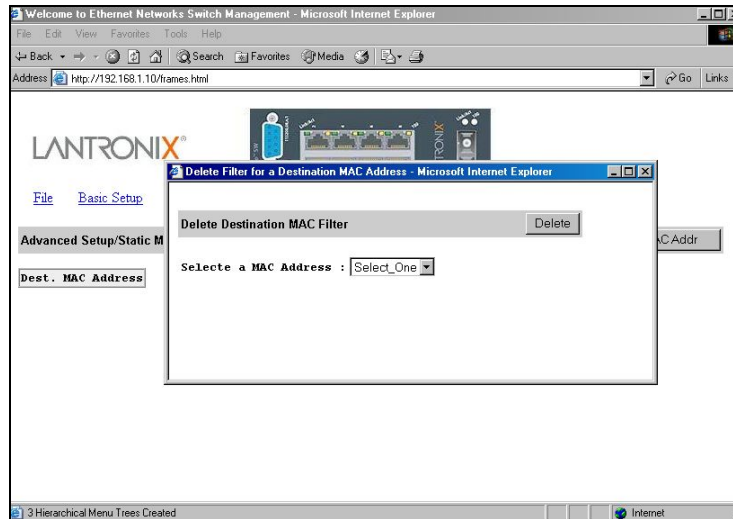
6. The **Delete Source MAC Address** window appears. Click the **Select a MAC Address** drop-down list and select the source MAC address you want to delete. Then click the **Delete** button.
7. A confirmation window appears. Close the confirmation window.

Destination MAC Address Filters

1. Click the **Advanced Setup** button, and point to **Static MAC Filters** in the selection menu. Click **Destination MAC Address Filters**.
2. Click **Add MAC Addr** button to add a destination MAC address for static filtering. Refer to Step 2~4 in **Source MAC Address Filters** section for similar procedure.

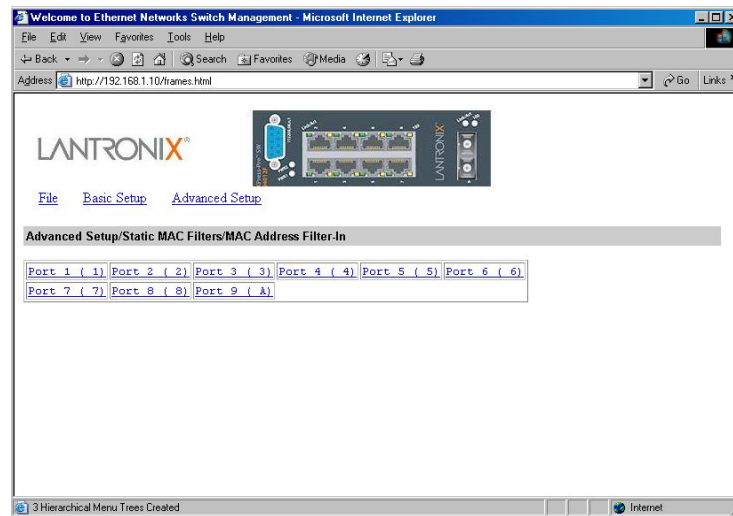


3. Click **Delete MAC Addr** button to delete a destination MAC address for static filtering. Refer to steps 5-7 in **Source MAC Address Filters** section for similar procedure.

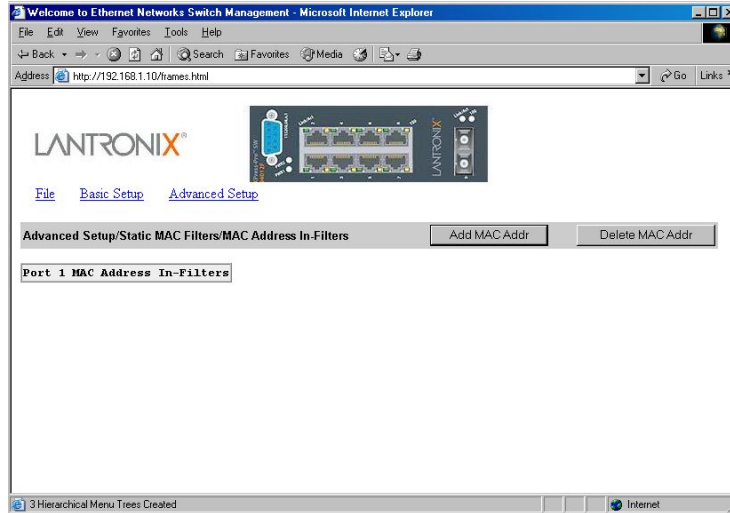


MAC Address In-Filters

1. Click **MAC Address In-Filters**. Click a port to add or delete In-Filters MAC Address.



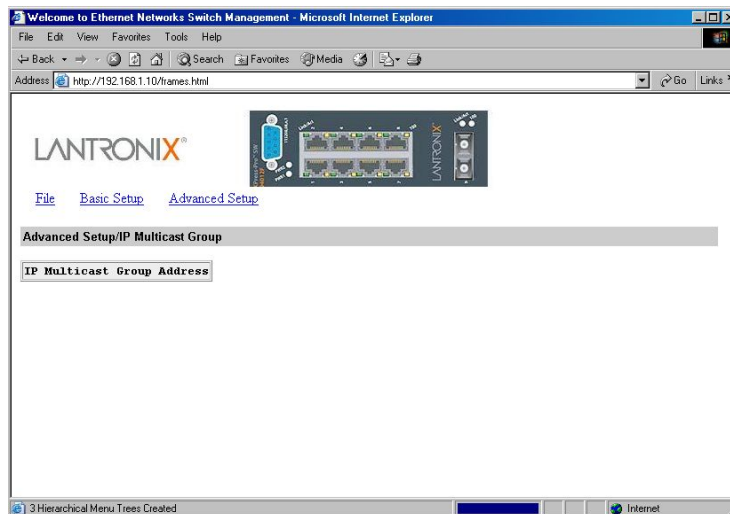
2. Click **Add MAC Addr** button to add an In-Filters MAC Address.



3. The **Add New MAC Address In-Filter** window appears. Click in the **MAC Address In-Filter** text box and type a unique MAC source address you want to add. Then click the **Add** button.
4. A confirmation window appears. Close the confirmation window.
5. If you no longer need an In-Filters MAC Address, click **Delete MAC Addr** button to delete it in step 2.
6. The **Delete MAC Address In-Filter** window appears. Click the **Select a MAC Address** drop-down list and select the In-Filters MAC Address you want to delete. Then click the **Delete** button.
7. A confirmation window appears. Close the confirmation window.

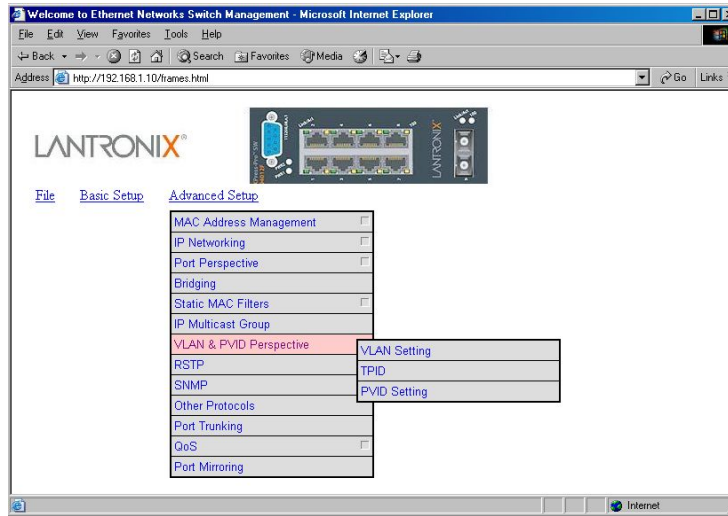
IP Multicast Group

1. To view the IP multicast group addresses, click the **Advanced Setup** button, and click **IP Multicast Group** in the selection menu. The information is read-only.



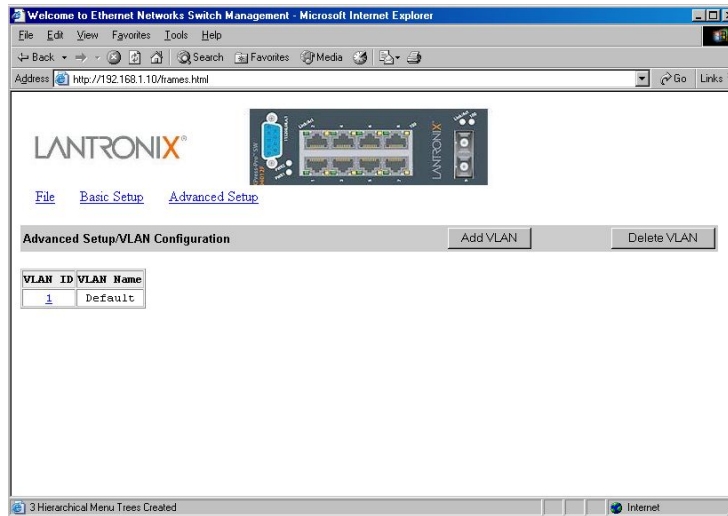
VLAN & PVID Perspective

1. To view the VLAN configuration information, click the **Advanced Setup** button, and point to **VLAN & PVID Perspective** in the selection menu.

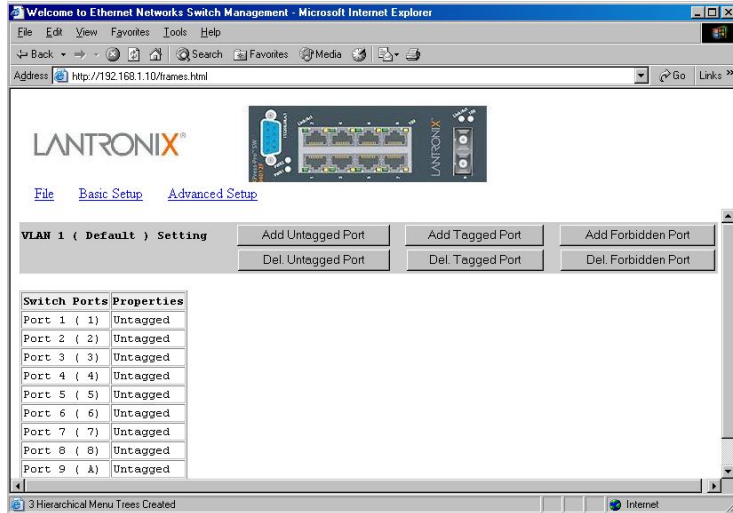


VLAN Setting

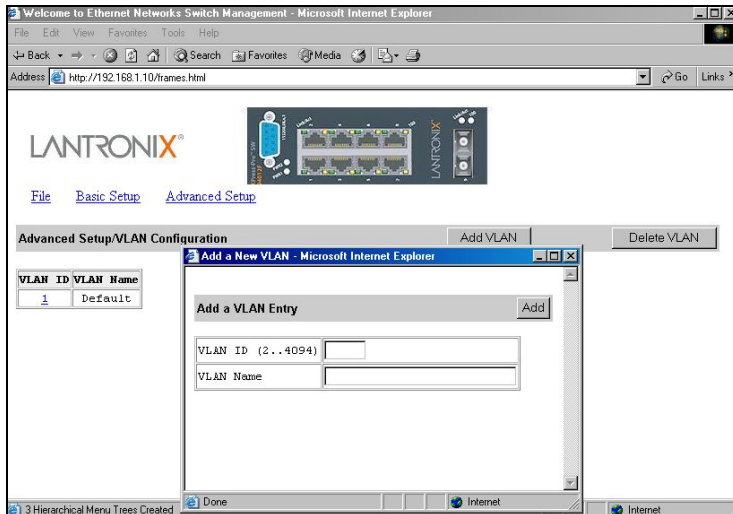
1. Click VLAN Setting.
2. Click on a VLAN ID whose VLAN configuration you want to change.



3. The **VLAN Setting** window appears. Add or delete switch ports for VLAN ID 1. For each switch, the port options include **Tagged Ports**, **Untagged Ports**, or **Forbidden Ports**.

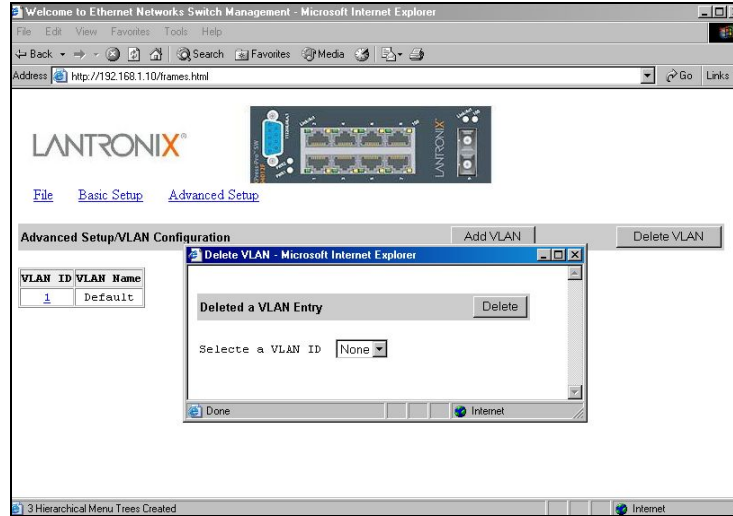


4. Click on the **Add VLAN** button to create a new VLAN.
5. The **Add a New VLAN** window appears.



6. Click in the **VLAN ID** textbox and specify a new VLAN ID number from 2~4094.
7. Click in the **VLAN Name** textbox and type a name for this newly created VLAN.
8. Assign switch ports to this VLAN. For each switch, the port options include **Tagged Ports**, **Untagged Ports**, or **Forbidden Ports**.
9. Click **Add Now!** button.
10. Click on the **Delete VLAN** button to delete a VLAN. VLAN ID 1 is the default VLAN and cannot be deleted.





11. The **Delete VLAN** window appears.
12. Click the drop-down menu to select a VLAN ID, which you want to delete.
13. Click the **Delete** button.

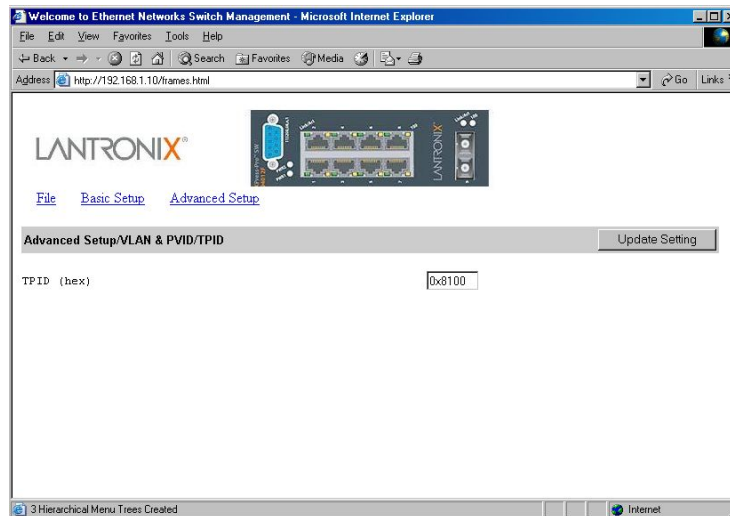
**Note:** \* No precautionary message appears before you delete a VLAN. \* Be sure you want to delete it before doing so.

TPID

1. Click **TPID**.

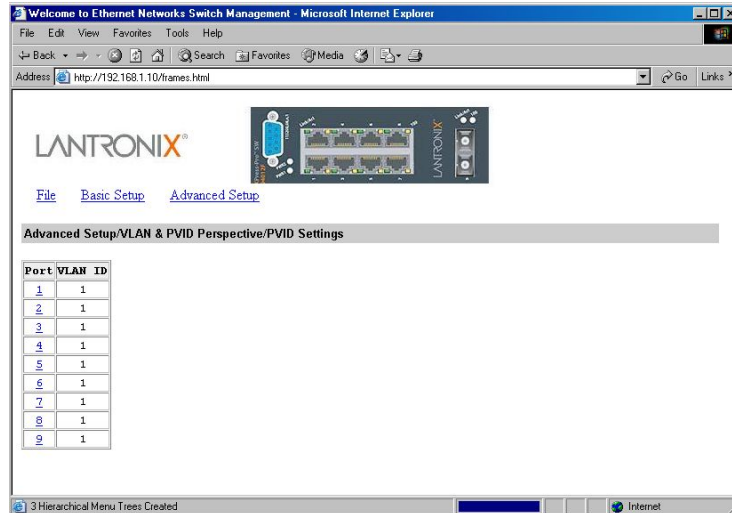
TPID Setting

1. Click TPID Setting.
2. Click in the TPID textbox and type an address for TPID.

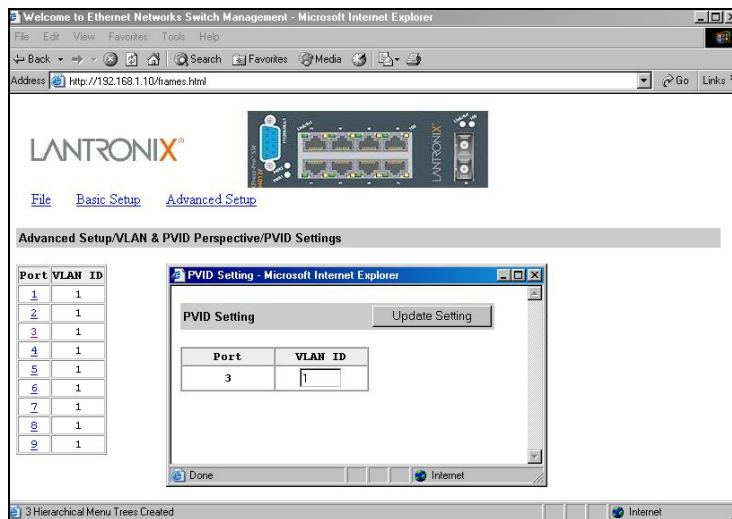


PVID Setting

1. Click PVID Setting.

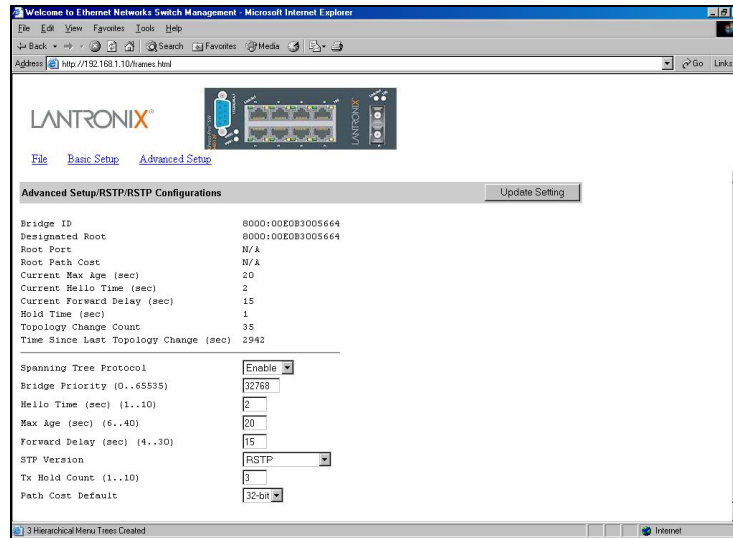


2. Click on a Port to assign VLAN ID to this port.



### RSTP (Rapid Spanning Tree Protocol)

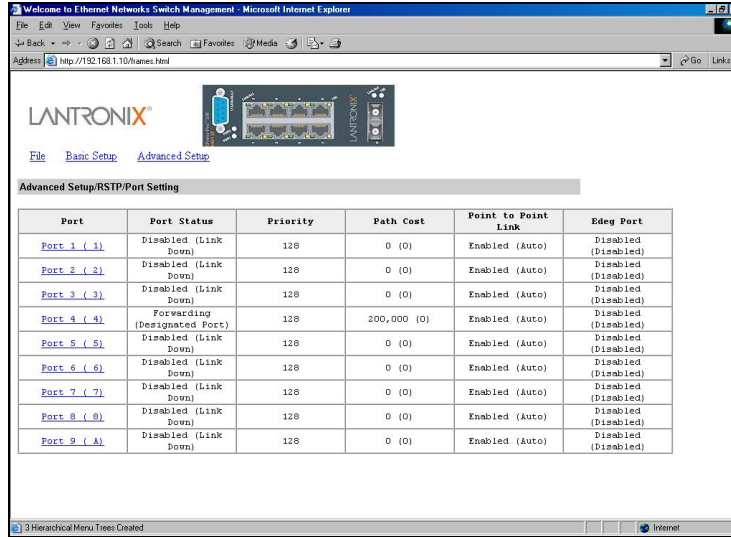
1. To view the rapid spanning tree protocol parameters, click the **Advanced Setup** button, and point to **RSTP** in the selection menu.
2. To view and/or change the RSTP configurations, click **Configurations** from the above screen.



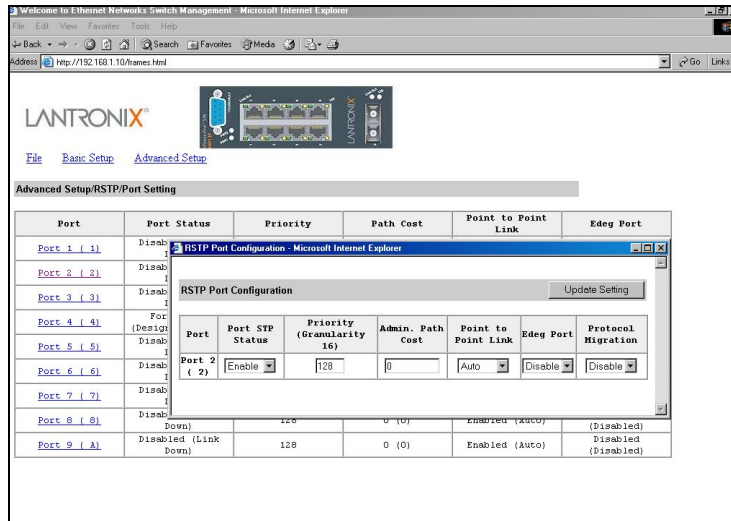
3. For **Spanning Tree Protocol**, specify whether you want to have it Disabled or Enabled by clicking the drop-down list.
4. For **Bridge Priority**, click in the text box and type a decimal number between 0 and 65535.
5. For **Hello Time**, click in the text box and type a decimal number between 1 and 10.
6. For **Max Age**, click in the text box and type a decimal number between 6 and 40.
7. For **Forward Delay**, click in the text box and type a decimal number between 4 and 30.
8. For **STP Version**, specify whether you want to choose STP Compatible or RSTP by clicking the drop-down list.
9. For **Tx Hold Count**, click in the text box and type a decimal number between 1 and 10.
10. For **Path Cost Default**, specify whether you want to choose 16-bit or 32-bit by clicking the drop-down list.
11. Click **Update Setting**. A confirmation window appears. Close the confirmation window.

#### Port Setting

1. To view and/or change the RSTP Port Configuration by port, click the **Advanced Setup** button, point to **RSTP** in the selection menu, and click **Port Setting**.



- In the **Port** column, click the port whose RSTP Port Configuration you want to change.

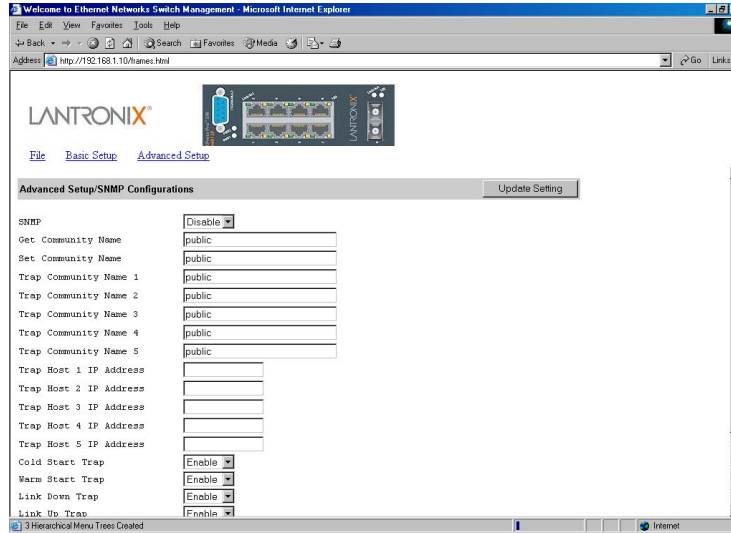


- For **Port STP Status**, specify whether the Port STP Status is Enable or Disable by clicking the drop-down list.
- For **Priority**, click in the text box and type a decimal number as a new priority value.
- For **Admin. Path Cost**, click in the text box and type a decimal number as a new admin. path cost value.
- For **Point to Point Link**, specify whether the Point to Point Link is Enable, Disable, or Auto by clicking the drop-down list.
- For **Edge Port**, specify whether the Edge Port is Enable or Disable by clicking the drop-down list.
- For **Protocol Migration**, specify whether the Protocol Migration is Enable or Disable by clicking the drop-down list.

9. Click **Update Setting**. A confirmation window appears. Close the confirmation window.

SNMP

1. To view and/or change all SNMP-related information, click the **Advanced Setup** button, and click **SNMP** in the selection menu. The **SNMP Configurations** window appears. As shown below, the factory-default **Community Name** value is **public**.

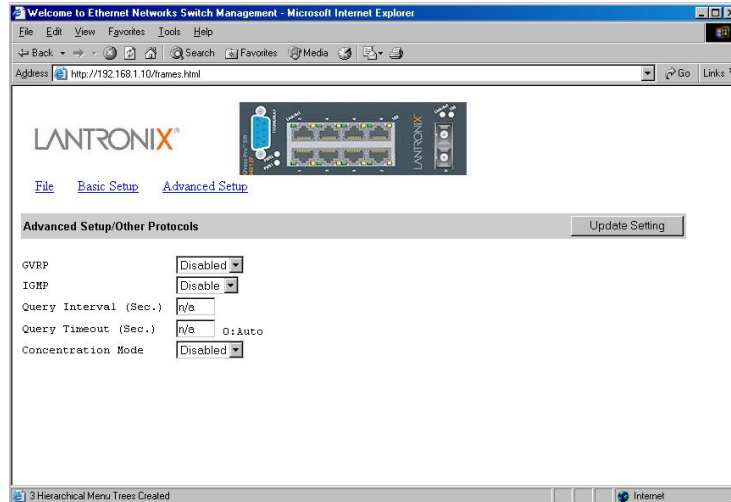


2. For **SNMP**, specify whether it is Disabled or Enabled by clicking the drop-down list.
3. For **Get Community Name**, click in the text box and type a get community name.
4. For **Set Community Name**, click in the text box and type a set community name.
5. For each **Trap Community Name**, click in the text box and type a trap community name.
6. For each **Trap Host IP Address**, click in the text box and type a IP address for trap host 1~5.
7. For **Cold Start Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
8. For **Warm Start Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
9. For **Link Down Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
10. For **Link Up Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
11. For **Authentication Failure Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
12. For **Rising Alarm Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
13. For **Failure Alarm Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.

14. For **Topology Change Trap**, specify whether it is Disabled or Enabled by clicking the drop-down list.
15. Click **Update Setting** when completed. A confirmation window appears. Close the confirmation window.

Other Protocols

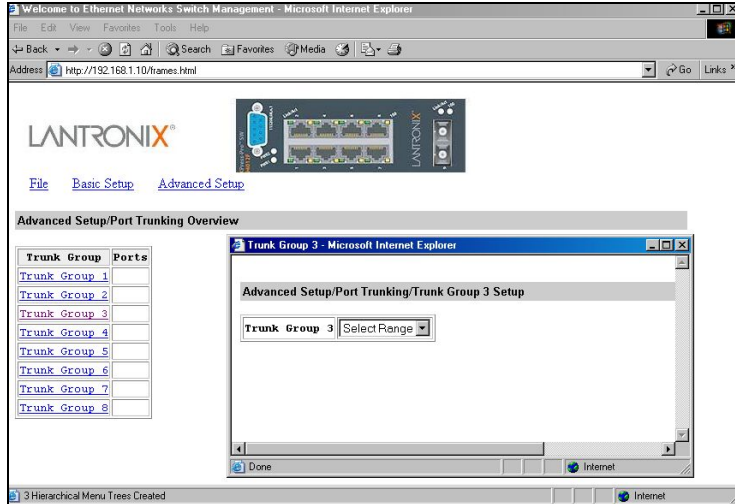
1. To enable or disable the GVRP and/or IGMP protocols, click the **Advanced Setup** button, and click **Other Protocols** in the selection menu.



2. For **GVRP**, specify whether it is Disabled or Enabled by clicking the drop-down list.
3. For **IGMP**, specify whether it is Disabled or Passive or Active by clicking the drop-down list.
4. For **Concentration Mode**, specify whether it is Disabled or Enabled by clicking the drop-down list.
5. Click **Update Setting** when completed. A confirmation window appears. Close the confirmation window.

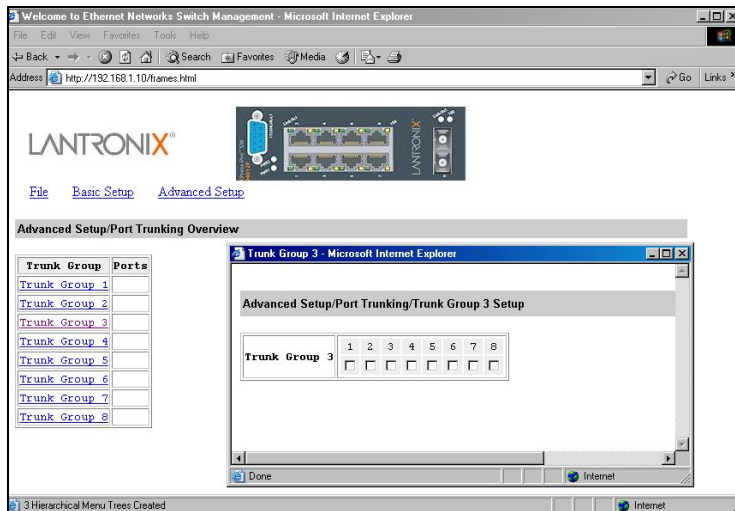
Port Trunking

1. To use the switch's trunking capability to gain more bandwidth, click the **Advanced Setup** button, and click **Port Trunking** in the selection menu. The **Port Trunking Overview** window appears. (E.g., click **Trunk Group 1** in the **Trunk Group** column.)



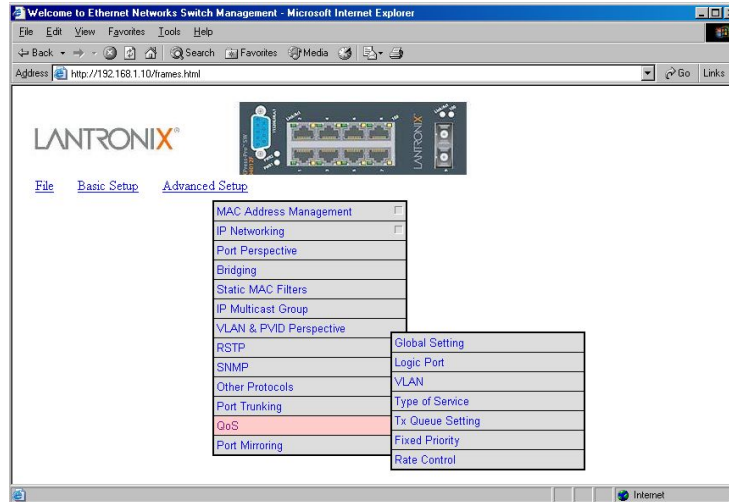
The **Trunk Group 1** window appears.

2. Click the drop-down menu to select a desired range.
3. Click to assign ports to the trunk group.



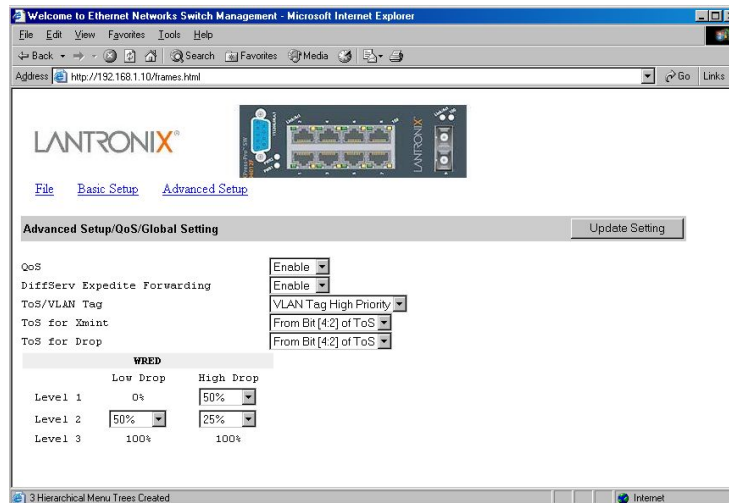
QoS

1. To use the Xpress-Pro SW 94000 switch's QoS capability, point to the **Advanced Setup** button, and point to **QoS** in the selection menu.



### Global Setting

1. Point to **Advanced Setup**, point to **QoS**, and Click **Global Setting**.



2. Use the **QoS** drop-down list to enable or disable QoS.
3. Use the **DiffServ Expedite Forwarding** drop-down list to specify whether you want to enable or disable DiffServ Expedite Forwarding.
4. Use the **ToS/VLAN Tag** drop-down list to select the priority you want to use.
5. Use the **ToS for Xmint** drop-down list to select the Bits of ToS you want to use.
6. Use the **ToS for Drop** drop-down list to select the Bits of ToS you want to use.
7. Under **WRED**, use the drop-down list boxes to select the:
  - ◆ High drop percentage for level 1.
  - ◆ Low drop and high drop percentages for level 2.

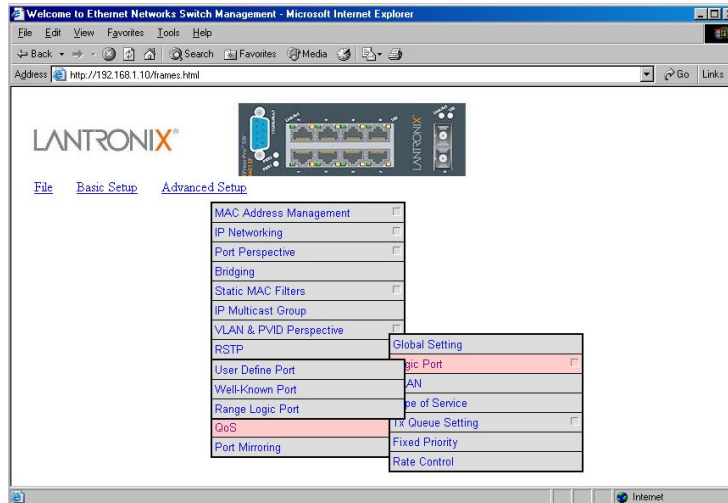
The low drop percentage for level 1 remains fixed at 0%, while the low drop and high drop percentages for level 3 remain fixed at 100%.



- Click **Update Setting** when completed. A confirmation window appears. Click to close the confirmation window.

Logic Port

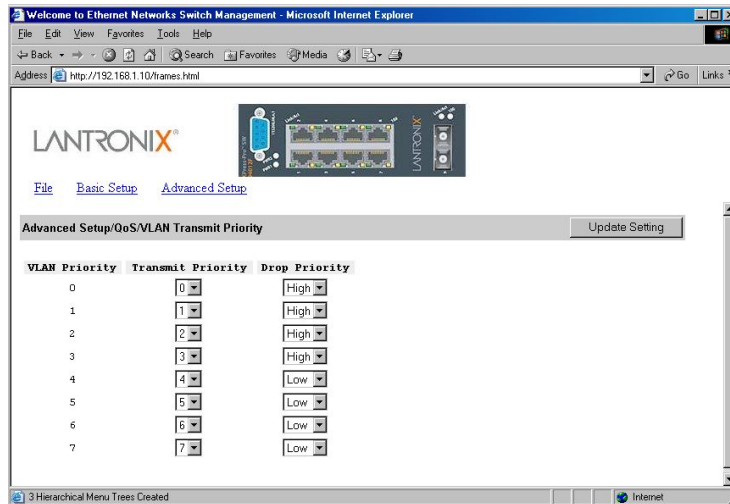
- Point to **Advanced Setup**, point to **QoS**, and Click **Logic Port**.



- Point to **Advanced Setup**, point to **QoS**, point to **Logic Port**, and click **User Define Port**, **Well-Known Port**, or **Range Logic Port**.
- Click **Update Setting** when completed. A confirmation window appears. Click to close the confirmation window.

VLAN

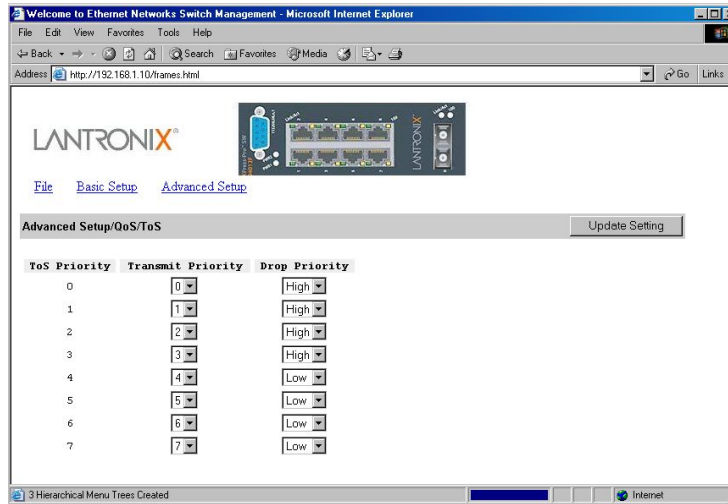
- Point to **Advanced Setup**, point to **QoS**, and Click **VLAN**.



- For each VLAN priority, use the right drop-down list to select a **Transmit Priority** for that VLAN and use the right drop-down list to select a High or Low **Drop Priority** for that VLAN.
- Click **Update Setting** when completed. A confirmation window appears. Click to close the confirmation window.

Type of Service

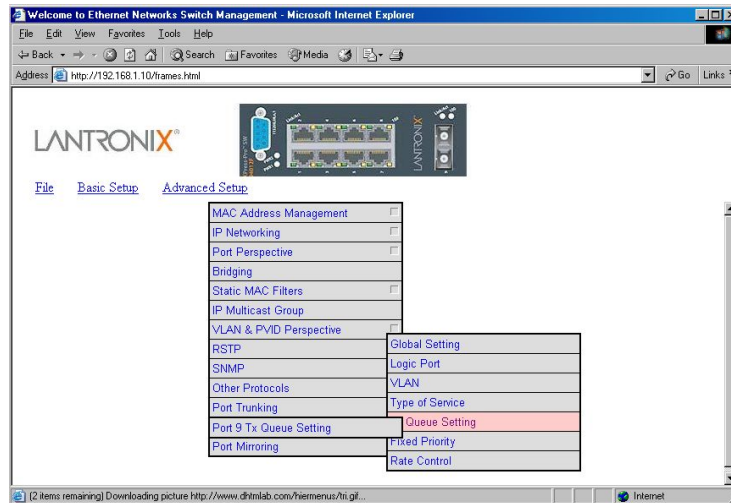
1. Point to Advanced Setup, point to QoS, and Click Type of Service.



2. For each Type of Service priority, use the right drop-down list to select a **Transmit Priority** for that Type of Service and use the right drop-down list to select a High or Low **Drop Priority** for that Type of Service.
3. Click **Update Setting** when completed. A confirmation window appears. Click to close the confirmation window.

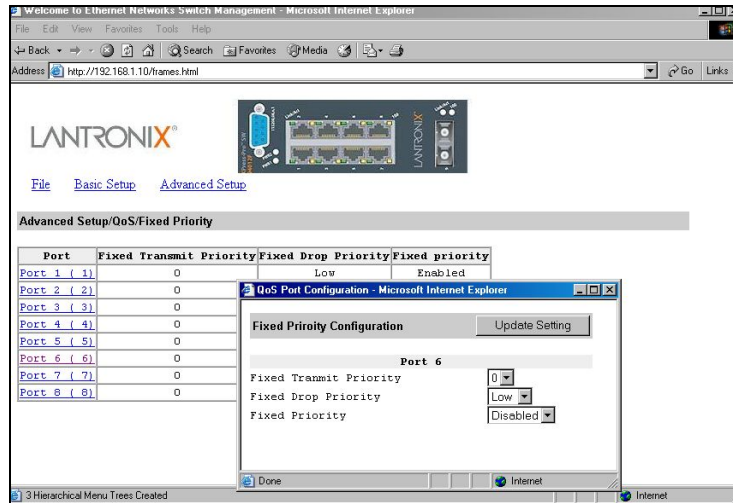
Tx Queue Setting

1. Point to Advanced Setup, point to QoS, point to Tx Queue Setting, and Click Port 9 Tx Queue Setting.



Fixed Priority

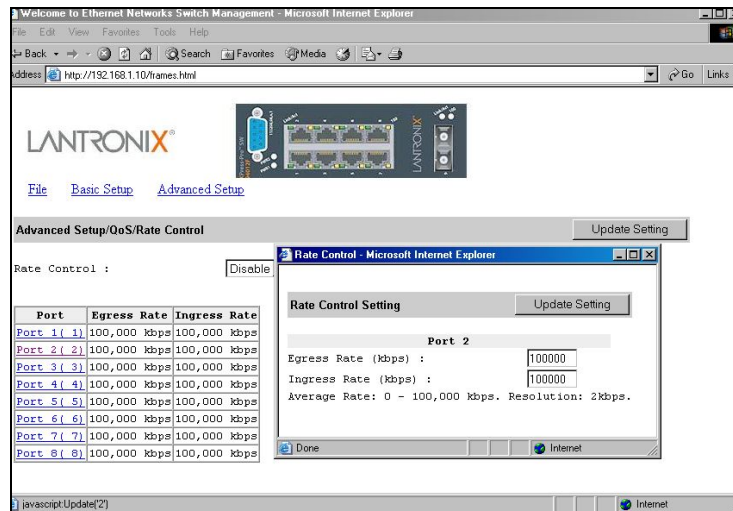
1. Point to **Advanced Setup**, point to **QoS**, and Click **Fixed Priority**.



2. Click a port number under **Port**. Use the **Fixed Transmit Priority**, **Drop Priority**, and **Priority** drop-down list to select a different priority for the port.
3. Click **Update Setting** when completed. A confirmation window appears. Click to close the confirmation window.

Rate Control

1. Point to **Advanced Setup**, point to **QoS**, and Click **Rate Control**.



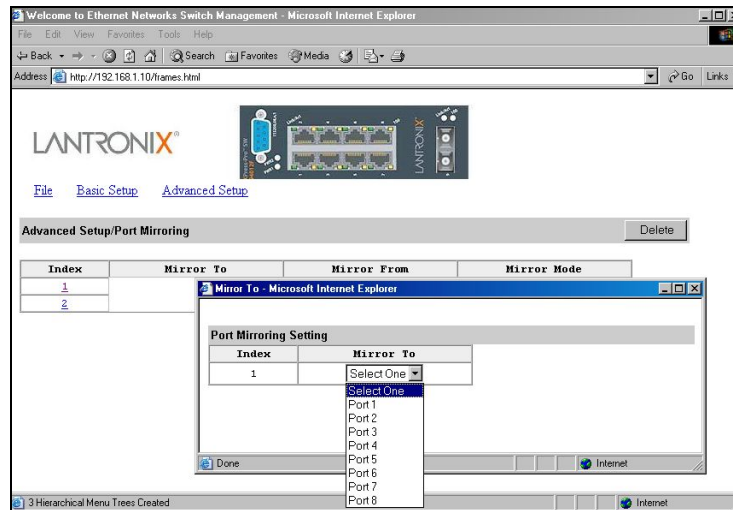
2. Use the **Rate Control** drop-down list to enable or disable rate control.
3. Click a port number under **Port**. Set the Egress Rate and Ingress Rate for the port.
4. Click **Update Setting** when completed. A confirmation window appears. Click to close the confirmation window.

Port Mirroring

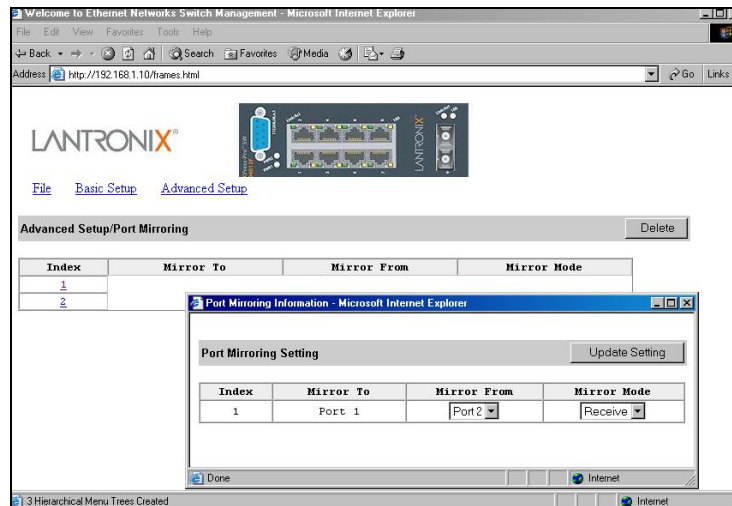
1. To use the Xpress-Pro SW 94000 switch’s mirroring capability to mirror one port to another port, click the **Advanced Setup** button, and click **Port Mirroring** in the selection menu.

## Mirror To

1. Click **1** or **2** in the **Index** column. In the **Mirror To** column, select a “mirror to” port by clicking the drop-down list. Data traffic will be mirrored to this port.



2. In the **Mirror From** column, select a “mirror from” port by clicking the drop-down list. Data traffic will be mirrored from this port.



3. In the **Mirror Mode** column, specify whether the “mirrored from” port will be receiving or transmitting data by clicking the drop-down list.
4. Click **Update Setting** when completed. A confirmation window appears. Close the confirmation window.

## 7: SNMP & RMON Management

This chapter describes the Xpress-Pro SW 94000 switch's Simple Network Management Protocol (SNMP) and Remote Monitoring (RMON) capabilities.

### Overview

RMON is an abbreviation for the Remote Monitoring MIB (Management Information Base). RMON is a system defined by the Internet Engineering Task Force (IETF) document RFC 1757, which defines how networks can be monitored remotely.

RMONs typically consist of two components: an RMON probe and a management workstation:

The RMON probe is an intelligent device or software agent that continually collects statistics about a LAN segment or VLAN. The RMON probe transfers the collected data to a management workstation on request or when a pre-defined threshold is reached.

The management workstation collects the statistics that the RMON probe gathers. The workstation can reside on the same network as the probe, or it can have an in-band or out-of-band connection to the probe.

The Xpress-Pro SW 94000 switch provides RMON capabilities that allow network administrators to set parameters and view statistical counters defined in MIB-II, Bridge MIB, and RMON MIB. RMON activities are performed at a Network Management Station running an SNMP network management application with graphical user interface.

### SNMP Agent and MIB-2 (RFC 1213)

The SNMP Agent running on the Xpress-Pro SW 94000 switch manager CPU is responsible for:

Retrieving MIB counters from various layers of software modules according to the SNMP GET/GET NEXT frame messages.

Setting MIB variables according to the SNMP SET frame message.

Generating an SNMP TRAP frame message to the Network Management Station if the threshold of a certain MIB counter is reached or if other trap conditions (such as the following) are met:

- ◆ Warm start
- ◆ Cold start
- ◆ Link up
- ◆ Link down

- ◆ Authentication failure
- ◆ Rising alarm
- ◆ Falling alarm
- ◆ Topology Alarm

MIB-2 defines a set of manageable objects in various layers of the TCP/IP protocol suites. MIB-2 covers all manageable objects from layer 1 to layer 4 and, as a result, is the major SNMP MIB supported by all vendors in the networking industry. The Xpress-Pro SW 94000 switch supports a complete implementation of SNMP Agent and MIB-2.

### RMON MIB (RFC 1757) and Bridge MIB (RFC 1493)

The Xpress-Pro SW 94000 switch provides hardware-based RMON counters in the Xpress-Pro SW 94000 switch chipset. The Xpress-Pro SW 94000 switch manager CPU polls these counters periodically to collect the statistics in a format that complies with the RMON MIB definition.

#### RMON Groups Supported

The Xpress-Pro SW 94000 switch supports the following RMON MIB groups defined in RFC 1757:

- ◆ RMON Statistics Group – maintains utilization and error statistics for the switch port being monitored.
- ◆ RMON History Group – gathers and stores periodic statistical samples from the previous Statistics Group.
- ◆ RMON Alarm Group – allows a network administrator to define alarm thresholds for any MIB variable. An alarm can be associated with Low Threshold, High Threshold, or both. A trigger can trigger an alarm when the value of a specific MIB variable exceeds a threshold, falls below a threshold, or exceeds or falls below a threshold.
- ◆ RMON Event Group – allows a network administrator to define actions based on alarms. SNMP Traps are generated when RMON Alarms are triggered. The action taken in the Network Management Station depends on the specific network management application.

The Xpress-Pro SW 94000 switch supports the following four groups of Bridge MIB (RFC 1493):

The dot1dBase Group – a mandatory group that contains the objects applicable to all types of bridges.

The dot1dStp Group – contains objects that denote the bridge's state with respect to the Spanning Tree Protocol. If a node does not implement the Spanning Tree Protocol, this group will not be implemented. This group is applicable to any transparent only, source route, or SRT bridge that implements the Spanning Tree Protocol.

The dot1dTp Group – contains objects that describe the entity's transparent bridging status. This group is applicable to transparent operation only and SRT bridges.

The dot1dStatic Group – contains objects that describe the entity's destination-address filtering status. This group is applicable to any type of bridge which performs destination-address filtering.

## 8: Specifications and Standards

| Specification                                | Description  |
|--|--|
| Xpress-Pro SW 94000                          | 10/100BaseTX auto-negotiating ports with RJ-45 connectors, 100BaseFX fiber ports, 10/100/1000BaseTX auto-negotiating ports with RJ-45 connectors, and 1000BaseSX/LX fiber ports combination  |
| Applicable Standards                         | IEEE 802.3 10BaseT<br>IEEE 802.3u 100BaseTX/FX<br>IEEE 802.3ab 1000BaseT<br>IEEE 802.3z 10BaseSX/LX  |
| Switching Method                             | Store-and-Forward  |
| Forwarding Rate                              |  |
| 10BaseT:                                     | 10 / 20Mbps half / full-duplex   |
| 100BaseTX/FX:                                | 100 / 200Mbps half / full-duplex   |
| 1000BaseT/SX/LX:                             | 2000Mbps full-duplex   |
| Performance                                  | 148,80pps for 10Mbps<br>148,800pps for 100Mbps<br>1,488,000pps for 1000Mbps  |
| Cable  |  |
| 10BaseT:                                     | 2-pair UTP/STP Cat. 3, 4, 5  |
| 100BaseTX:                                   | 2-pair UTP/STP Cat. 5  |
| 1000BaseT:                                   | 4-pair UTP/STP Cat. 5<br>Up to 100m (328ft)  |
| 100BaseFX:                                   | MMF (50 or 62.5µm), SMF (9 or 10µm)  |
| 1000BaseSX/LX:                               | MMF (50 or 62.5µm), SMF (9 or 10µm)  |
| LED Indicators                               | Per unit – Power status (PWR1, PWR2)<br>Per port –<br>10/100TX, 100FX –<br>(Green) LNK (Link) / ACT (Activity)<br>(Yellow) 100<br>10/100/1000TX, 1000SX/LX –<br>(Green) 1000<br>(Yellow) ACT |
| Dimensions                                   | W50mm × D125mm × H135mm  |
| Net Weight                                   | 0.8kg ( 1.76lbs. ) approx.   |
| Power  | Terminal Block: 10-30VDC   |
| Operating Voltage & Max. Current Consumption | 24VDC @ 0.77A  |
| Power Consumption                            | 18.48W max.  |
| Operating Temperature                        | -34°C to 74° C   |
| Storage Temperature                          | -45°C to 93°C  |
| Humidity                                     | 10%-95% non-condensing   |
| Emissions                                    | FCC part 15 Class A, CE Mark Class A   |

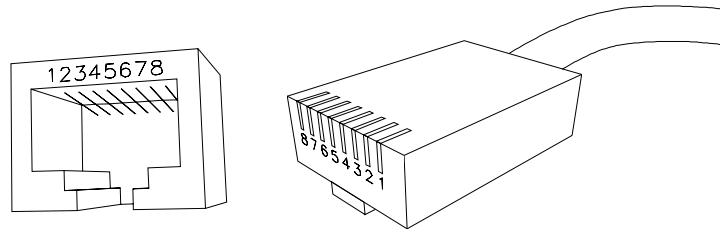


**Standards**

|   |
|---|
| ESD Standard (IEC 61000-4-2)                      |
| Radiated FRI Standards (IEC 61000-4-3)            |
| Burst Standards (IEC 61000-4-4)                   |
| Surge Standards (IEC 61000-4-5)                   |
| Induced (Conducted) RFE Standards (IEC 61000-4-6) |
| Magnetic Field Standards (IEC 61000-4-8)          |
| Voltage Dips Standards (IEC 61000-4-11)           |
| Environmental Test Standards:                     |
| Vibration Resistance (IEC 60068-2-6)              |
| Shock (IEC 60068-2-27)                            |
| Free Fall (IEC 60068-2-32)                        |

## A: Connector Pinouts

### Pin Arrangement of RJ45 Connectors



The following table lists the pinout of 10/100BaseT/TX ports.

| Pin | Regular Ports          | Uplink port            |
|-----|------------------------|------------------------|
| 1   | Input Receive Data +   | Output Transmit Data + |
| 2   | Input Receive Data -   | Output Transmit Data - |
| 3   | Output Transmit Data + | Input Receive Data +   |
| 4   | NC                     | NC                     |
| 5   | NC                     | NC                     |
| 6   | Output Transmit Data - | Input Receive Data -   |
| 7   | NC                     | NC                     |
| 8   | NC                     | NC                     |

The following table lists the pinout of 10/100/1000BaseTX ports.

| Pin Ports |    |
|-----------|----|
| 1         | A+ |
| 2         | A- |
| 3         | B+ |
| 4         | C+ |
| 5         | C- |
| 6         | B- |
| 7         | D+ |
| 8         | D- |